Atlas of Physical Oceanographic Data for the Gulf Stream System - 1972

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These reports contain scientific and technical information of a type that represents a contribution to existing knowledge but which is not normally found in the primary literature. The subject matter is generally related to programs and interests of the Ocean Science and Surveys (OSS) sector of the Department of Fisheries and Oceans.

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Technical Reports are produced regionally but are numbered and indexed nationally. Requests for individual reports will be fulfilled by the issuing establishment listed on the front cover and title page. Out of stock reports will be supplied for a fee by commercial agents.

Regional and headquarters establishments of Ocean Science and Surveys ceased publication of their various report series as of December 1981. A complete listing of these publications and the last number issued under each title are published in the *Canadian Journal of Fisheries and Aquatic Sciences*, Volume 38: Index to Publications 1981. The current series began with Report Number 1 in January 1982.

Rapport technique canadien sur l'hydrographie et les sciences océaniques

Ces rapports contiennent des renseignements scientifiques et techniques qui constituent une contribution aux connaissances actuelles mais que l'on ne trouve pas normalement dans les revues scientifiques. Le sujet est généralement rattaché aux programmes et intérêts du service des Sciences et Levés océaniques (SLO) du ministère des Pêches et des Océans.

Les rapports techniques peuvent être considérés comme des publications à part entière. Le titre exact figure au-dessus du résumé du chaque rapport. Les résumés des rapports seront publiés dans la revue Résumés des sciences aquatiques et halieutiques et les titres figureront dans l'index annuel des publications scientifiques et techniques du Ministère.

Les rapports techniques sont produits à l'échelon régional mais sont numérotés et placés dans l'index à l'échelon national. Les demandes de rapports seront satisfaites par l'établissement auteur dont le nom figure sur la couverture et la page de titre. Les rapports épuisés seront fournis contre rétribution par des agents commerciaux.

Les établissements des Sciences et Levés océaniques dans les régions et à l'administration centrale ont cessé de publier leurs diverses séries de rapports depuis décembre 1981. Vous trouverez dans l'index des publications du volume 38 du *Journal canadien des sciences halieutiques et aquatiques*, la liste de ces publications ainsi que le dernier numéro paru dans chaque catégorie. La nouvelle série a commencé avec la publication du Rapport n° 1 en janvier 1982.

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Hydrography and Ocean Sciences 15

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ABSTRACT

Bellefontaine, L., Pritchard, J., and Reiniger, R. 1982. Atlas of physical oceanographic data for the Gulf Stream System - 1972. Can. Tech. Rep. Hydrogr. Ocean Sci. 15:

Physical oceanographic data from an area approximately south-east of the Grand Banks of Newfoundland, bounded roughly between 35° and 43° North latitude, and 39° West longitude are presented in vertical sections.

Data from current meters moored within this same general area but north of, and parallel to, the Tail of the Grand Banks are presented in various graphical displays including time series, progressive vector, and stick plots.

Résumé

Bellefontaine, L., Pritchard, J., and Reiniger, R. 1982. Atlas of physical oceanographic data for the Gulf Stream system - 1972. Can. Tech. Rep. Hydrogr. Ocean Sci. 15:

L'auteur présente dans des coupes transversales certaines données océanographiques provenant d'une zone située à peu près au sud-est des Grands bancs de Terre-Neuve et approximativement comprise entre les 35e et 43e parallèles nord et les 39e et 50e méridiens ouest.

D'autres données sont tirées des courantomètres ancrés à l'intérieur de cette zone, mais au nord de la Queue des Grands bancs et en parallèle avec celle-ci. Elles sont présentées au moyen de graphiques et diagrammes divers, comprenant notamment des séries chronologiques, des vecteurs progressifs et des graphiques des vecteurs sous forme de "bâtonnets".

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CURRENT METER ANALYSIS

EACH MOORING IS REPRESENTED AT INDIVIDUAL LEVELS BY:

(a) STATISTICAL SUMMARY & JOINT DISTRIBUTION

(b) TIME SERIES PLOT (2 PLOTS)

(c) PROGRESSIVE VECTOR PLOT

(d) STICK PLOT

(12) STATION 1 1300 M 30–34

(13) STATION 1 2500 M 35–39

(14) STATION 2 2900 M 40–44

(15) STATION 15 750 M 45–49

(16) STATION 15 1750 M 50–54

(17) STATION 17 2750 M 55–59

(18) STATION 1 3500 M 60–64

(19) STATION 18 2750 M 65–69

(20) STATION 18 3500 M 70–74

(21) STATION 18 4250 M 75–79

(22) STATION 19 3250 M 80–84

(23) STATION 19 3750 M 85–89

(24) STATION 20 4150 M 90–94

(25) STATION 20 4650 M 95–99

(26) STATION 21 4650 M 100–104

(27) STATION 22 4250 M 105–109

(28) STATION 22 4750 M 110–114

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INTRODUCTION

This publication contains prepared material derived from data collected during the voyage of the CSS Hudson from April 12, 1972 to June 11, 1972.

The scientific objective of the experiment was to improve our understanding of the Gulf Stream system in a region Southeast of the Grand Banks of Newfoundland. Two other vessels, the R.V. Chain from Woods Hole Oceanographic Institution, and the R.V. Cirolana from the Fisheries Laboratory, Lowestoft, England carried out similar programs of research in the same area.

While their particular data do not form a part of this atlas, it is discussed jointly in a paper "Current System South and East of the Grand Banks of Newfoundland" J.P.O. 10 1 January 1980.

Data in this atlas are presented in two parts, firstly, sections of temperature, salinity, dissolved oxygen, and nutrients, and secondly, the current meter data.

All the physical oceanographic data presented in this atlas are archived by the Marine Environment Data Service (MEDS) Department of Fisheries and Oceans, Ottawa, except the current meter data which are available from the Atlantic Oceanographic Laboratory.

This atlas does not represent the entire data collection from this cruise.

BOTTOM PROFILES

A precision graphic recorder was operated more or less continuously on the cruise, and bottom profiles have been drawn on all the sections. The soundings were corrected using Matthews, D.J.

1944 Tables, and are archived by the Oceanic Bathymetry and GEBCO Unit, Dept. of Environment, Ottawa.

Continuous navigation was provided using a Austron rho-rho Loran C receiver which was calibrated using fixes obtained from the satellite navigation system.

TEMPERATURE

All temperatures are expressed in degrees Celsius. Temperatures were measured with Richter and Wiese or Yoshino reversing thermometers. They are considered accurate to ±0.02°C.

SALINITY

Salinity determinations were made with an "Auto-Lab" inductive salinometer. They are considered accurate to ± 0.004°/... The salinities were calculated using the UNESCO (1966) tables.

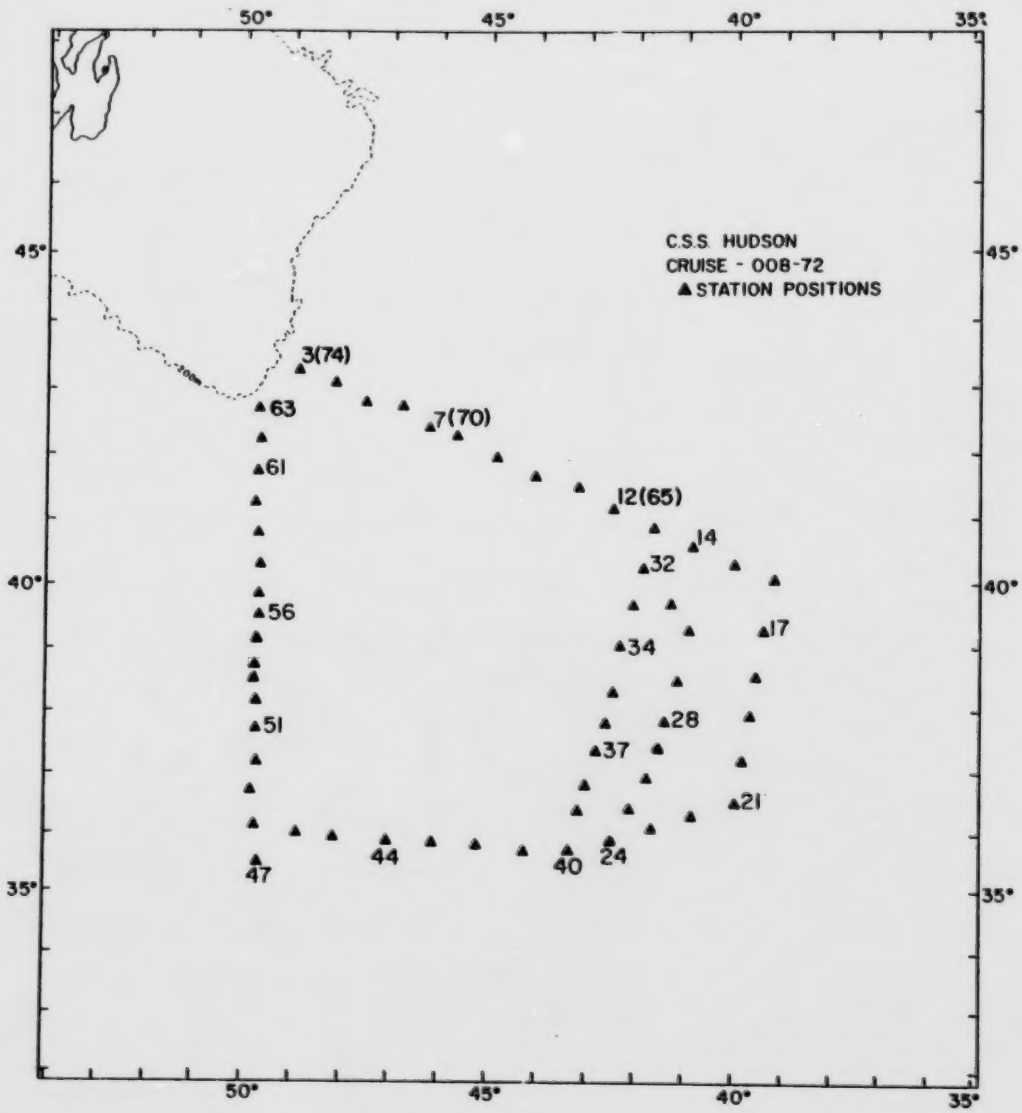
OXYGEN

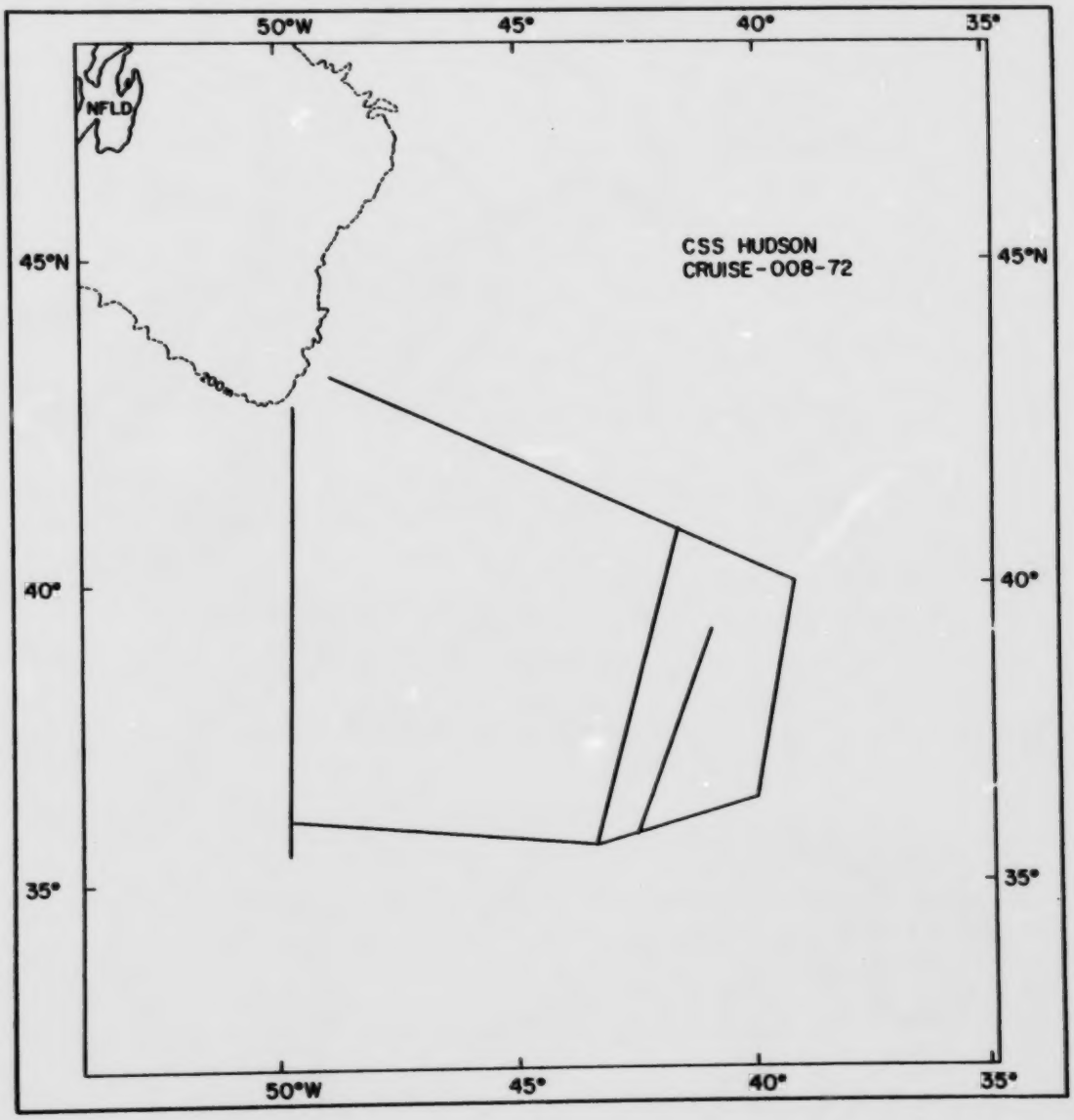
Dissolved oxygen content was determined by the Carpenter modification of the Winkler method using 60 ml sample bottles. The precision of the measurements based on the CSK Standards was calculated to be ±.05 ml/l.

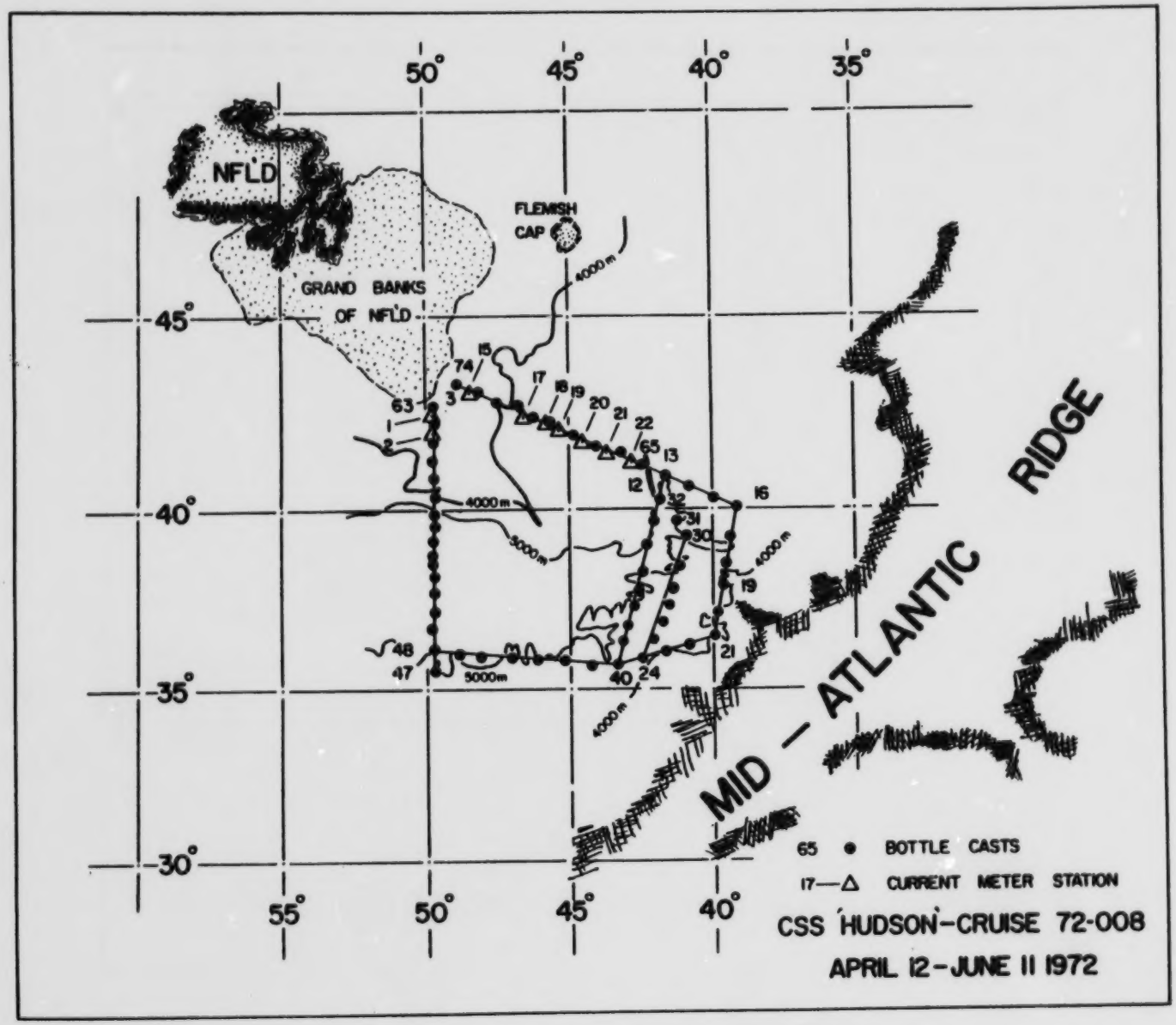
NUTRIENTS

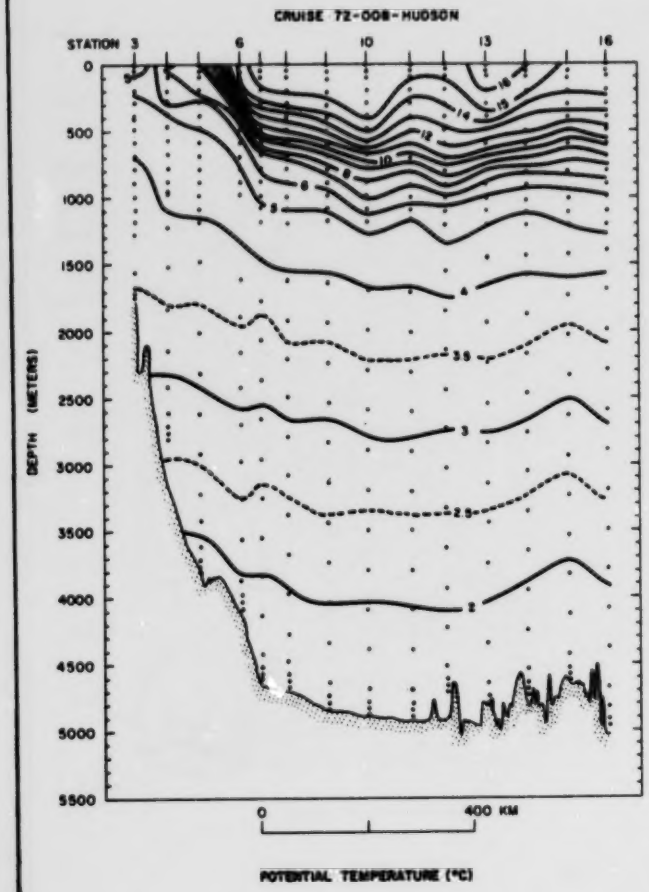
The nutrient components of sea water; silicate, nitrate and phosphate were determined by continuous flow analysis using a Technicon Auto Analyzer I. The methods used and statistical data for this cruise are described in Automatic Analysis at Sea (Coote,

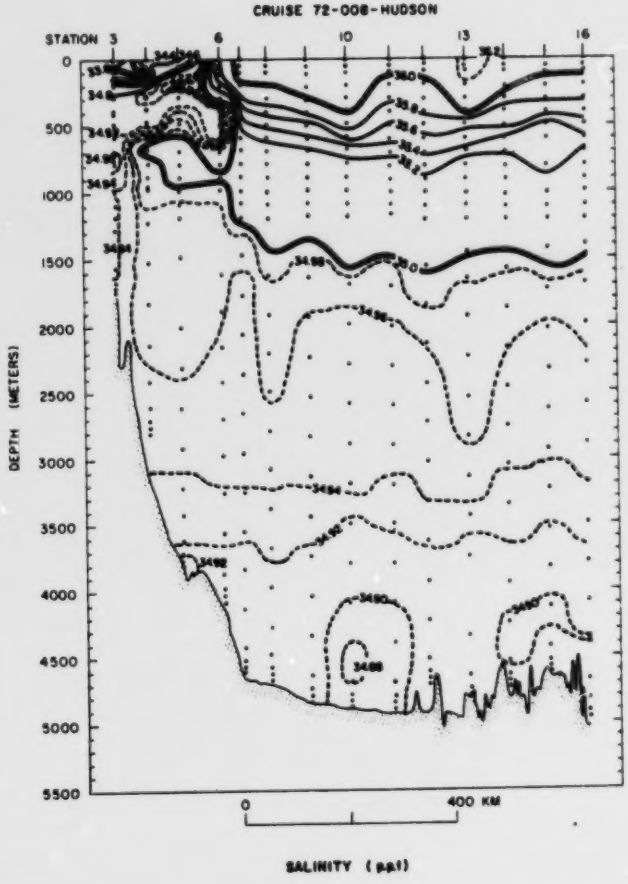
Duedall and Hiltz, 1971)*. The coefficient of variation was 0.6% for a single silicate determination and 6% for phosphate determination derived from varied CSK standards. The precision for nitrate though not determined would have been between those values.

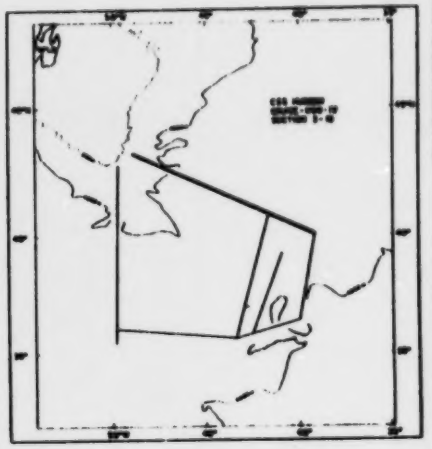

50°
45°
40°
35°
C.S.S. HUDSON
CRUISE - 008-72
▲ STATION POSITIONS
3(74)
7(70)
12(65)
14
32
17
34
28
37
21
63
61
56
51
47
44
40
24

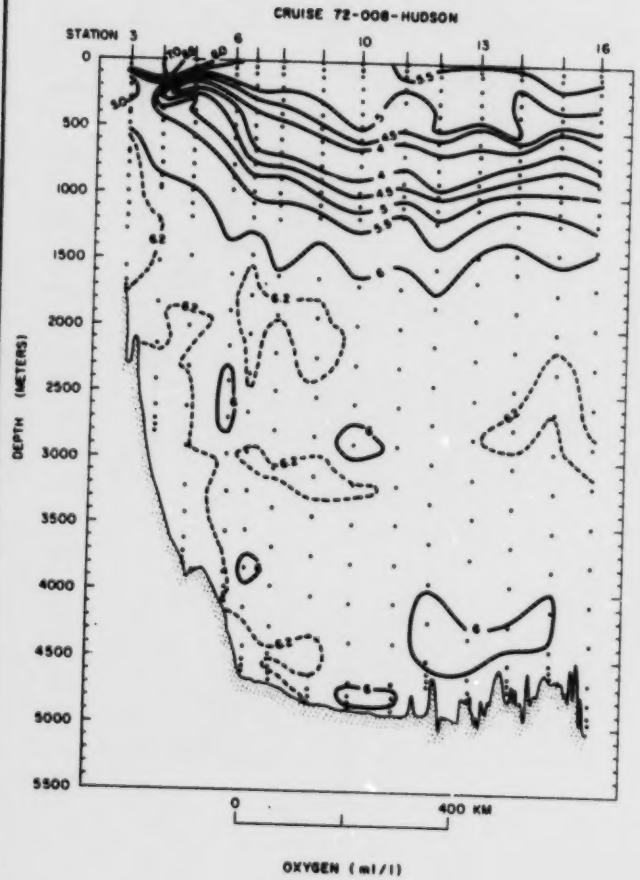

50°W
45°
40°
35°
NFLD
45°N
CSS HUDSON
CRUISE-008-72
100m
40°
35°

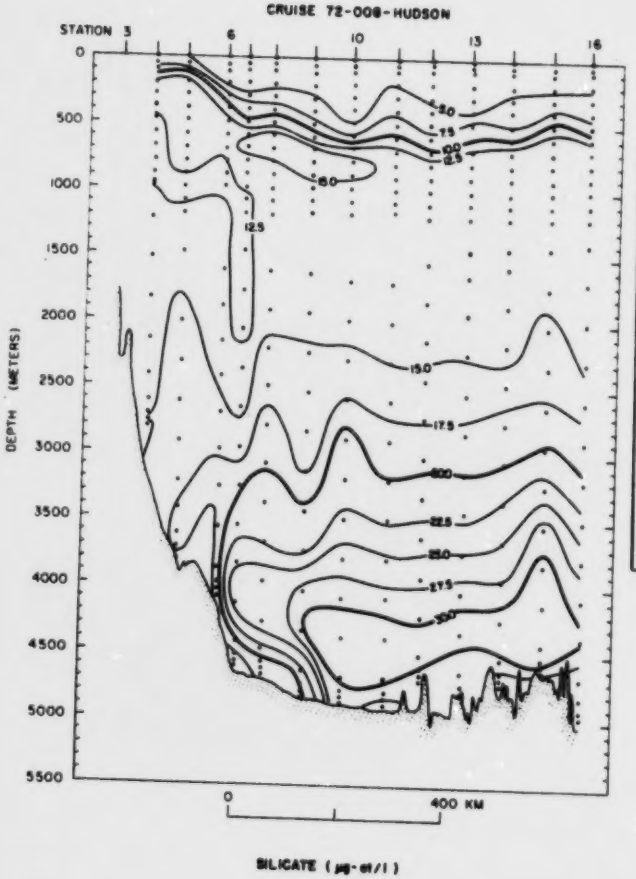

50°
45°
40°
35°
NFLD
FLEMISH CAP
GRAND BANKS OF NFLD
45°
40°
35°
30°
55°
50°
45°
40°
4000m
5000m
MID - ATLANTIC RIDGE
65 ● BOTTLE CASTS
17—△ CURRENT METER STATION
CSS 'HUDSON'-CRUISE 72-008
APRIL 12-JUNE 11 1972

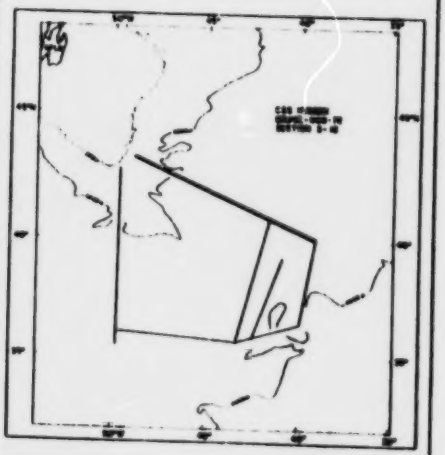

CRUISE 72-008-HUDSON
STATION 3
6
10
13
16
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
DEPTH (METERS)
0
400 KM
POTENTIAL TEMPERATURE (°C)

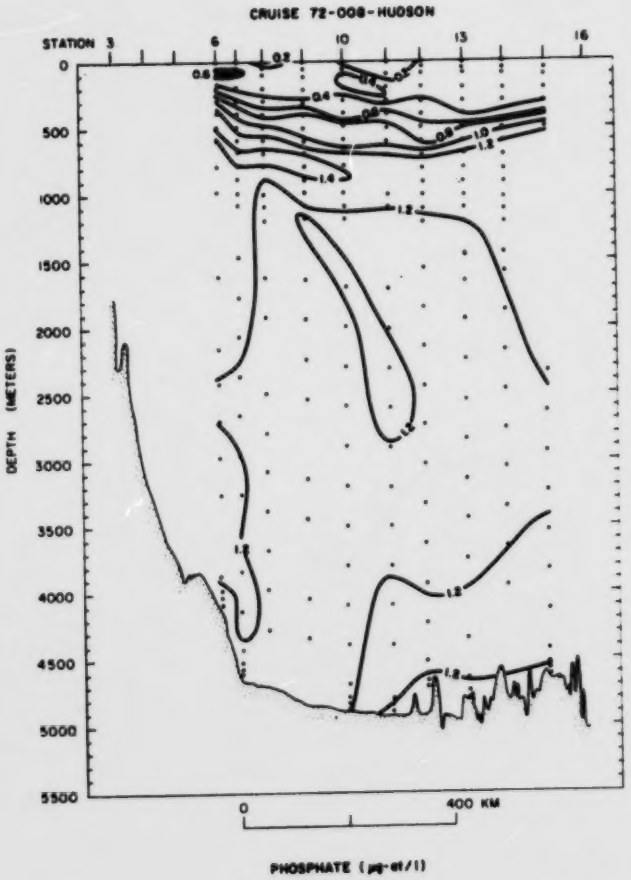

CRUISE 72-008-HUDSON
STATION 3
6
10
13
16
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
DEPTH (METERS)
0
400 KM
SALINITY (ppt)

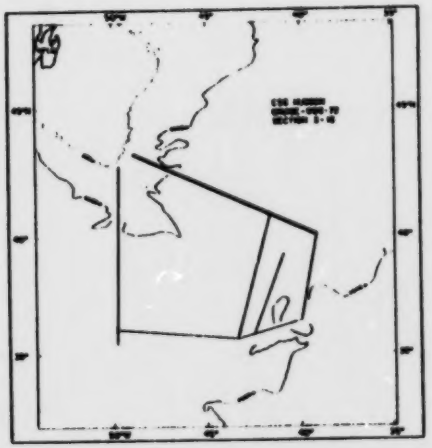


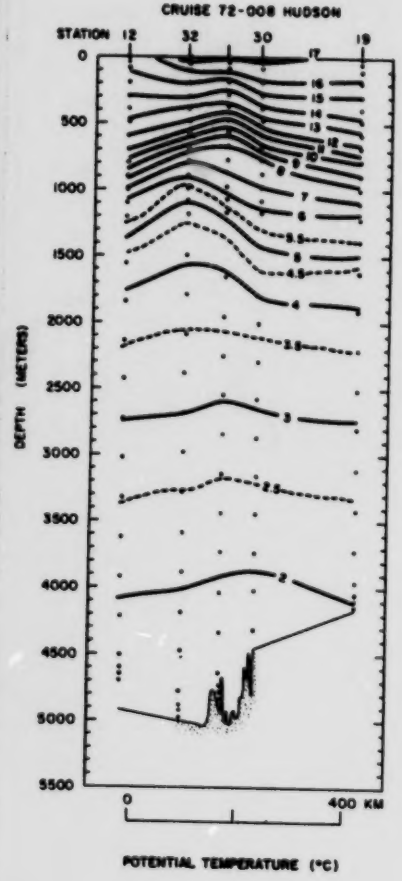

CRUISE 72-008-HUDSON
STATION 3
6
10
13
16
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
DEPTH (METERS)
0
400 KM
OXYGEN (ml/l)

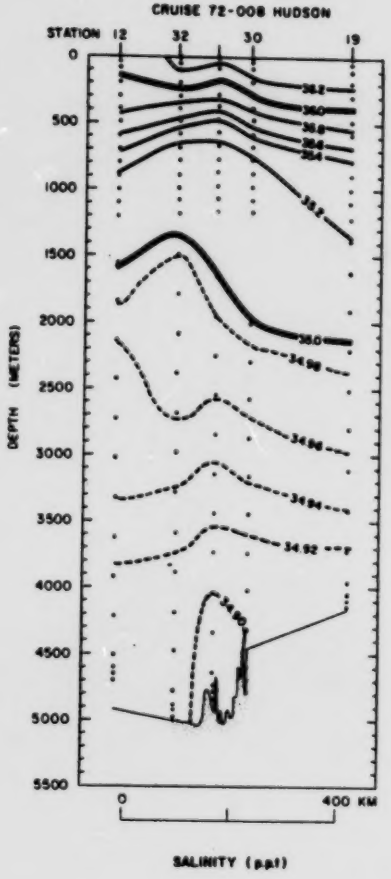

CRUISE 72-008-HUDSON
STATION 3
6
10
13
16
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
DEPTH (METERS)
0
400 KM
SILICATE (µg-at/l)




CRUISE 72-008-HUDSON
STATION 3
6
10
13
16
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
DEPTH (METERS)
0.2
0.4
0.6
0.8
1.0
1.2
1.4
0
400 KM
PHOSPHATE (µg-at/l)




CRUISE 72-008 HUDSON
STATION 12 32 30 19
DEPTH (METERS)
0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500
0 400 KM
POTENTIAL TEMPERATURE (°C)


CRUISE 72-008 HUDSON
STATION 12 32 30 19
DEPTH (METERS)
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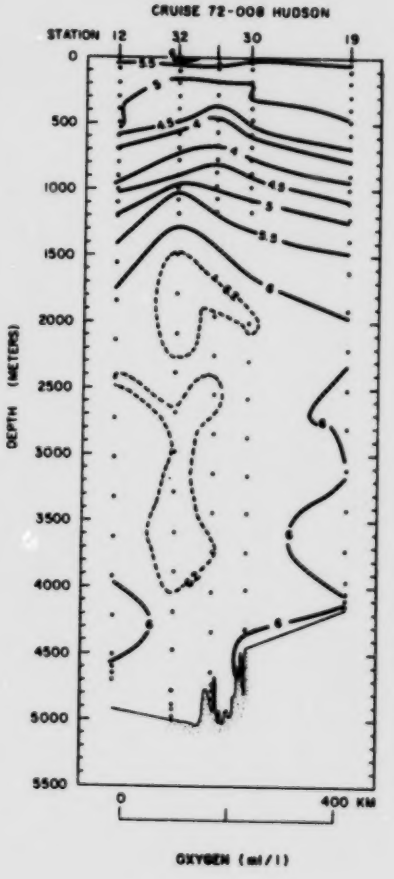
0 400 KM
SALINITY (p.p.t)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STATION 12 32 30 19
DEPTH (METERS)
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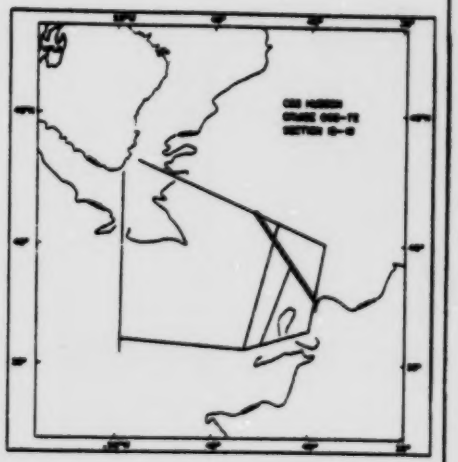
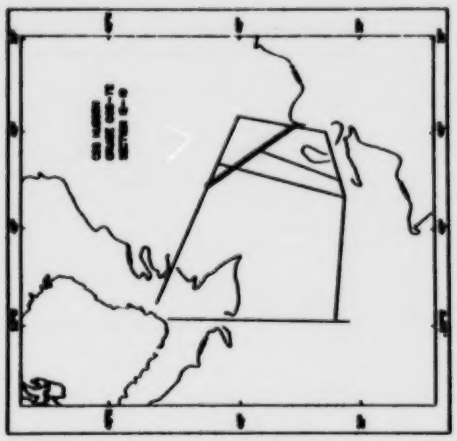
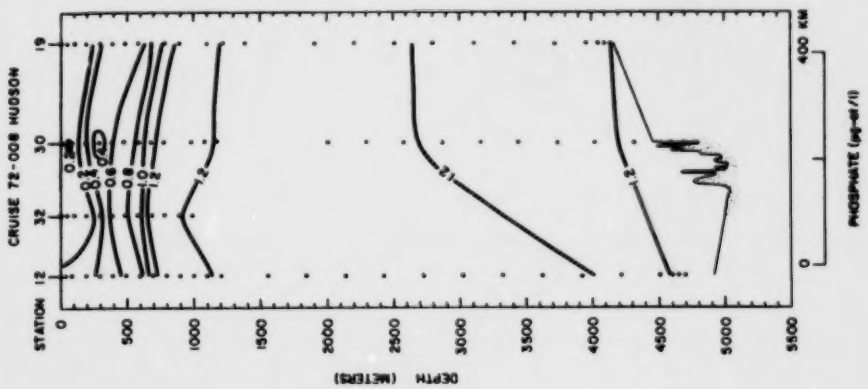
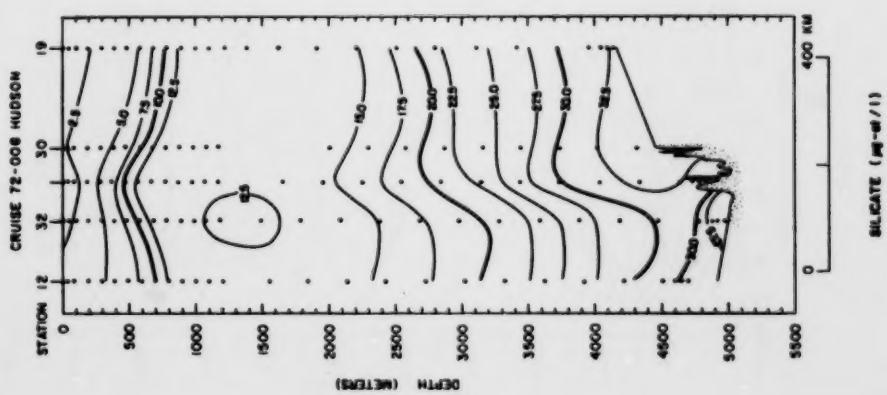
0 400 KM
OXYGEN (ml/l)






CRUISE 72-008 HUDSON
STATION
DEPTH (METERS)
PHOSPHATE (µg-at/l)
400 KM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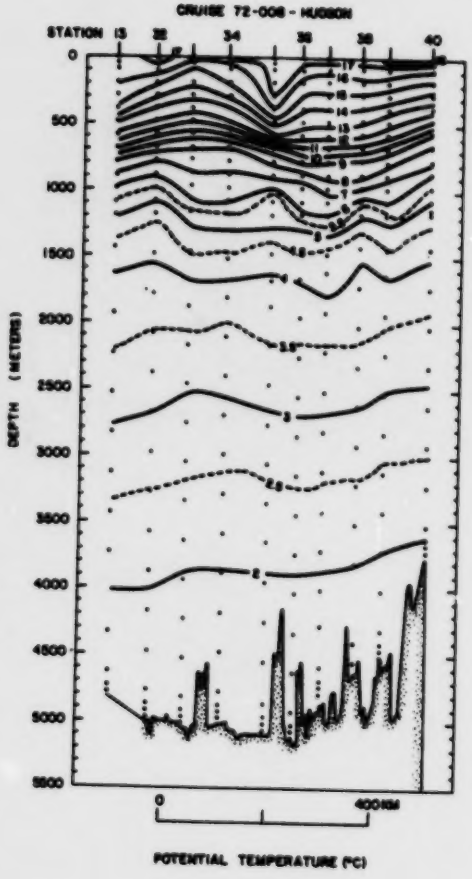
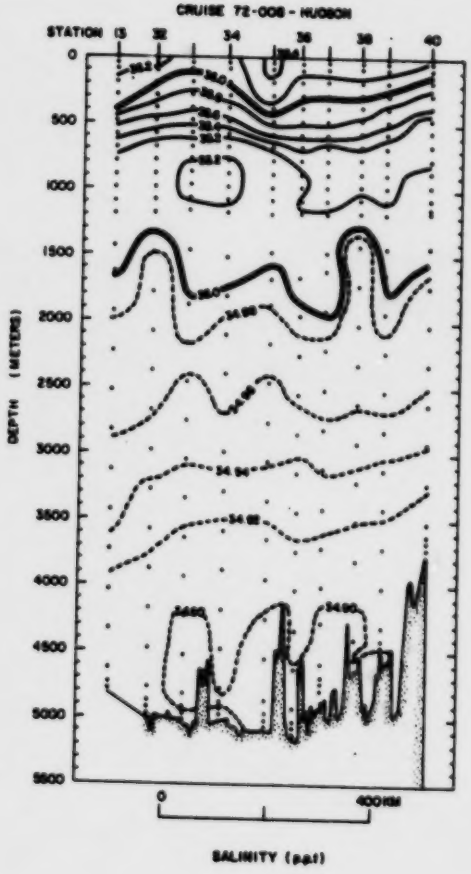
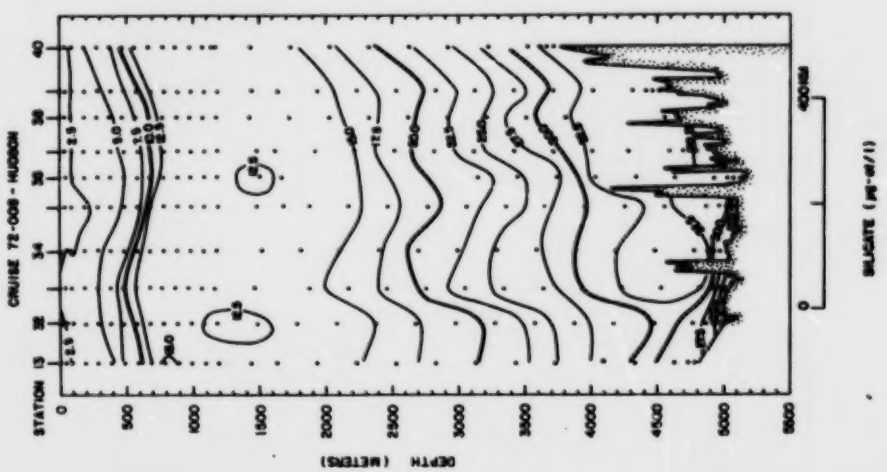
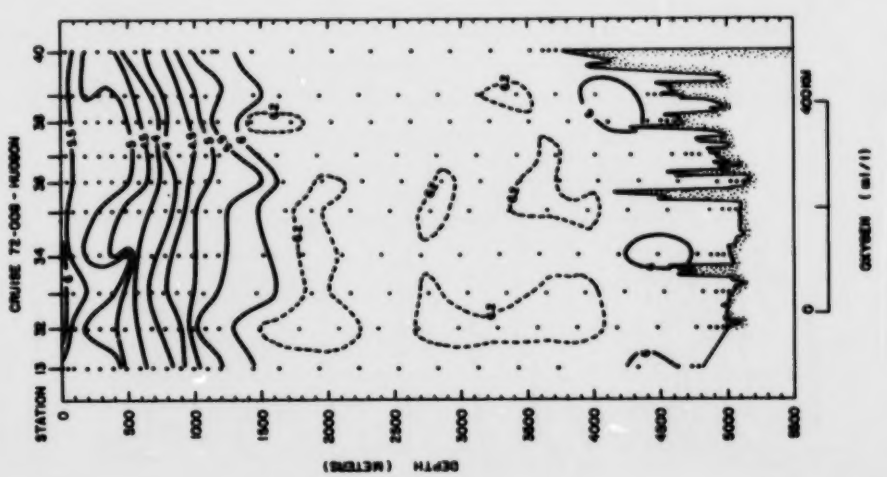
STATION
DEPTH (METERS)
SILICATE (µg-at/l)
400 KM


CRUISE 72-008 - HUDSON
STATION 13 32 34 35 36 40
DEPTH (METERS)
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
0
400KM
POTENTIAL TEMPERATURE (°C)


CRUISE 72-008 - HUDSON
STATION 13 32 34 36 38 40
DEPTH (METERS)
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
0
400KM
SALINITY (p.p.t)


CRUISE 72-009 - HUDSON
STATION
DEPTH (METERS)
SILICATE (µg-at/l)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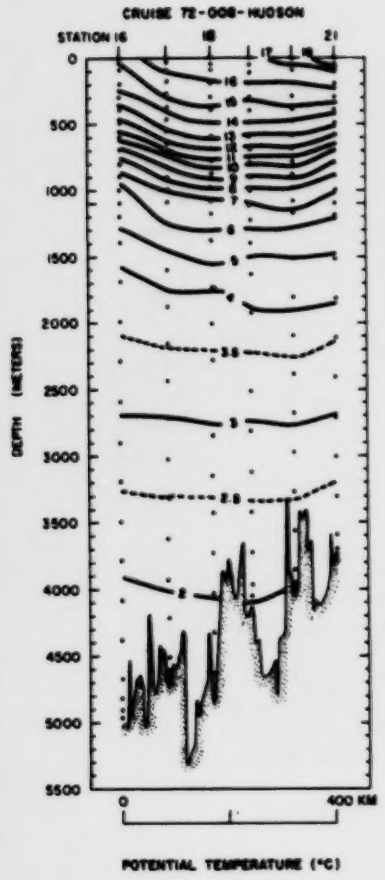
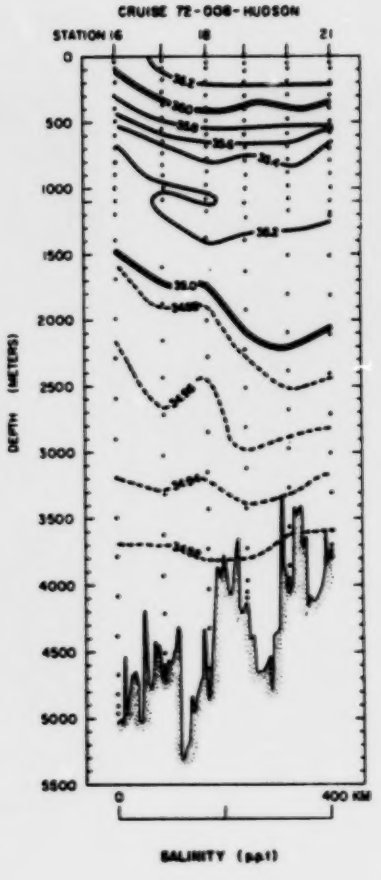
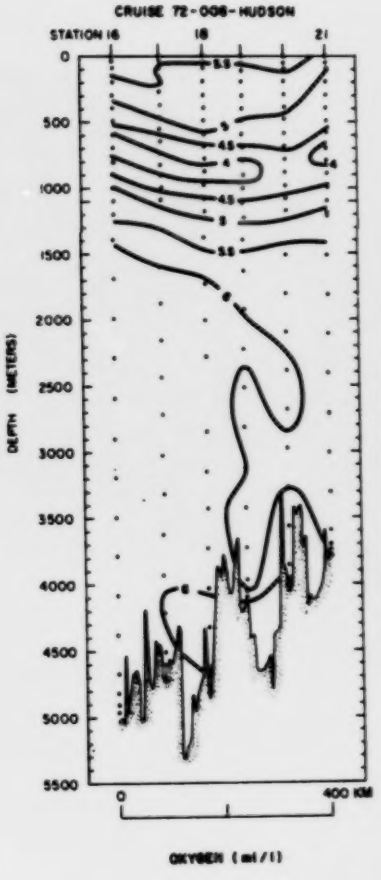
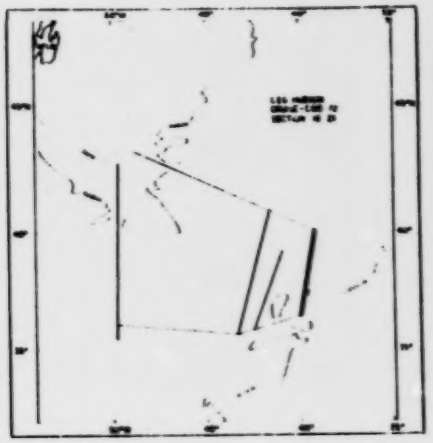
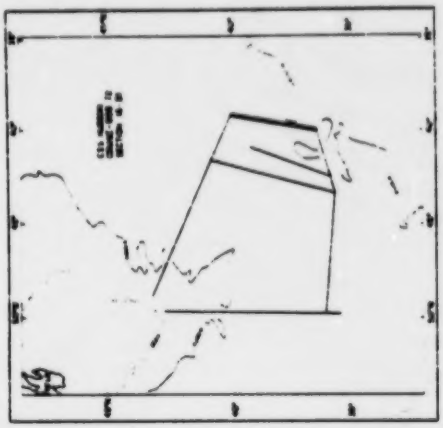
STATION
DEPTH (METERS)
OXYGEN (ml/l)

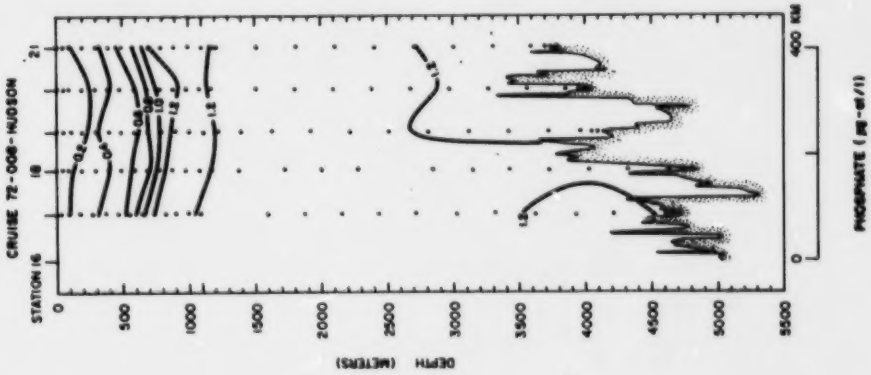

CRUISE 72-008-HUDSON
STATION 16
18
21
DEPTH (METERS)
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
0
400 KM
POTENTIAL TEMPERATURE (°C)

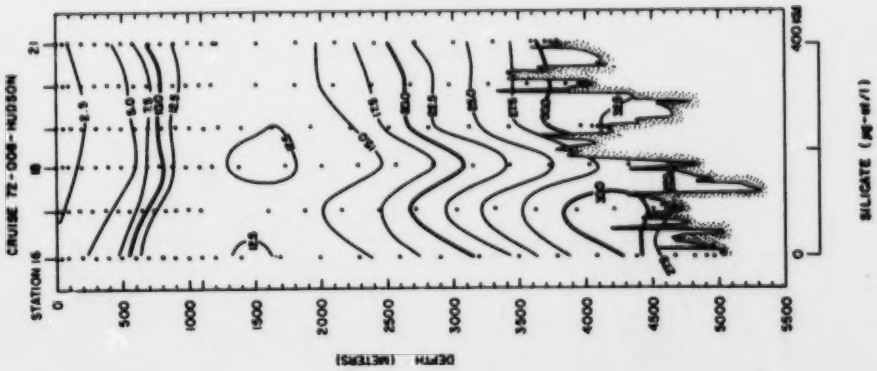

CRUISE 72-008-HUDSON
STATION 16
18
21
DEPTH (METERS)
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
0
400 KM
SALINITY (p.p.t)

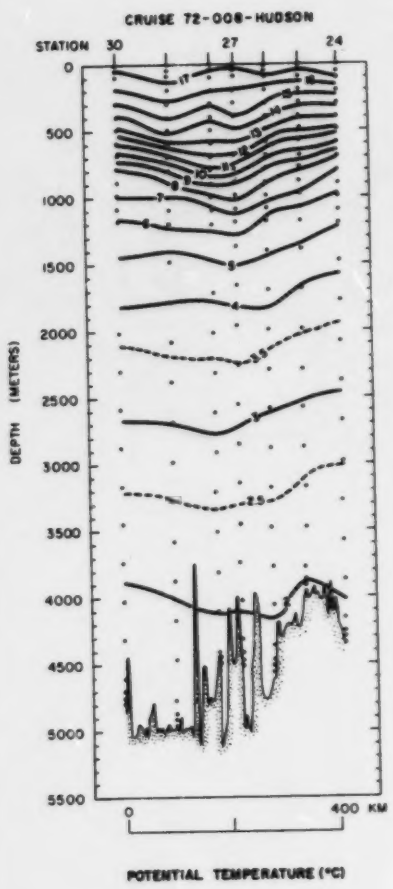

CRUISE 72-008-HUDSON
STATION 16
18
21
DEPTH (METERS)
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
0
400 KM
OXYGEN (ml/l)

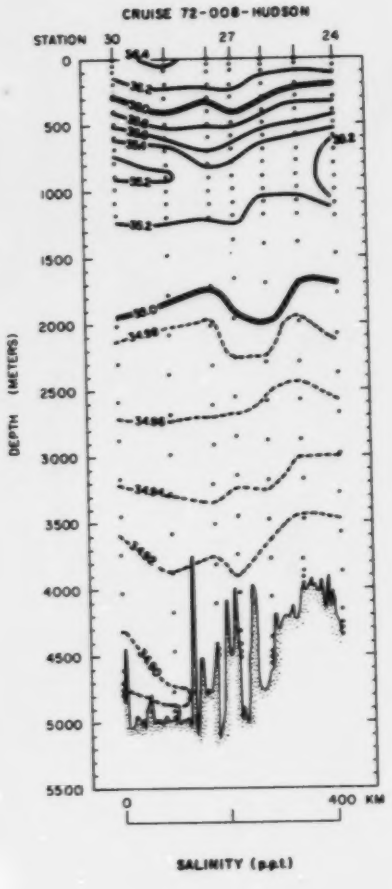


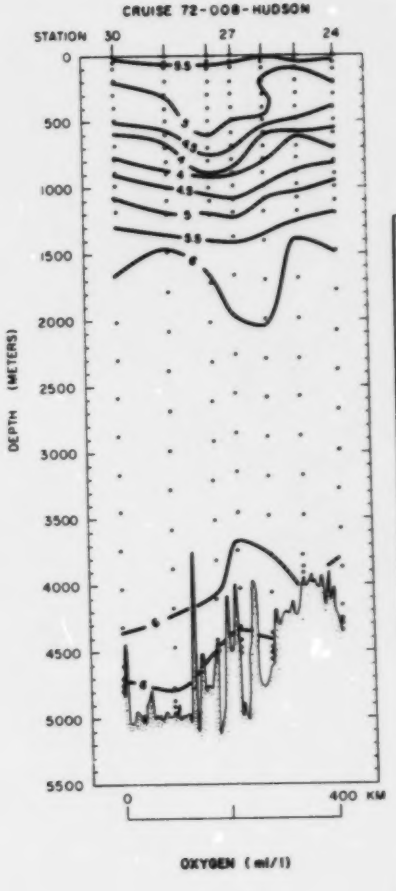


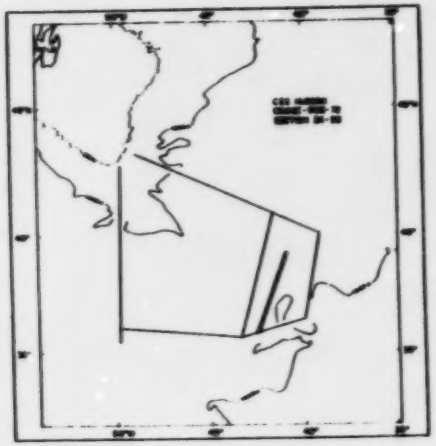

CRUISE 72-006-HUDSON
STATION 16
DEPTH (METERS)
PHOSPHATE (μg-at/l)

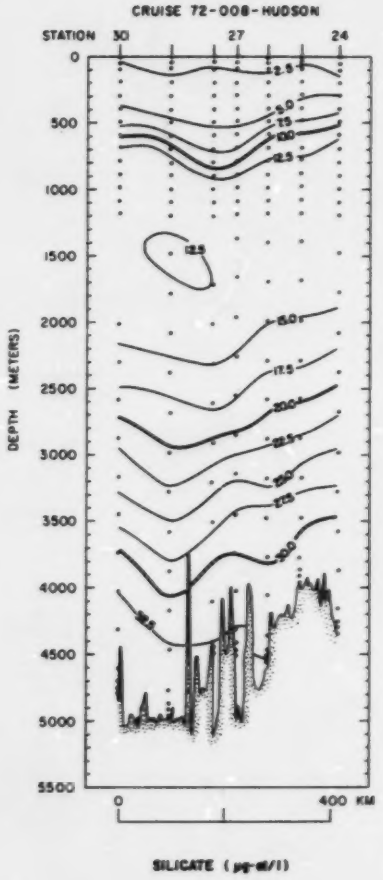

CRUISE 72-006-HUDSON
STATION 16
DEPTH (METERS)
SILICATE (μg-at/l)

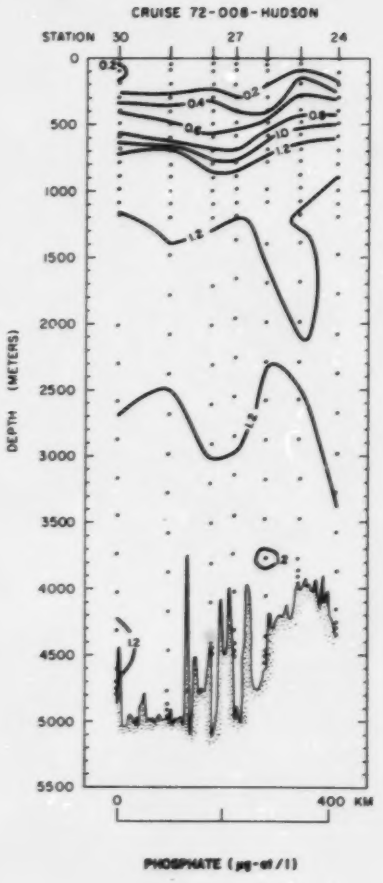

CRUISE 72-008-HUDSON
STATION 30 27 24
DEPTH (METERS)
0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500
0 400 KM
POTENTIAL TEMPERATURE (°C)

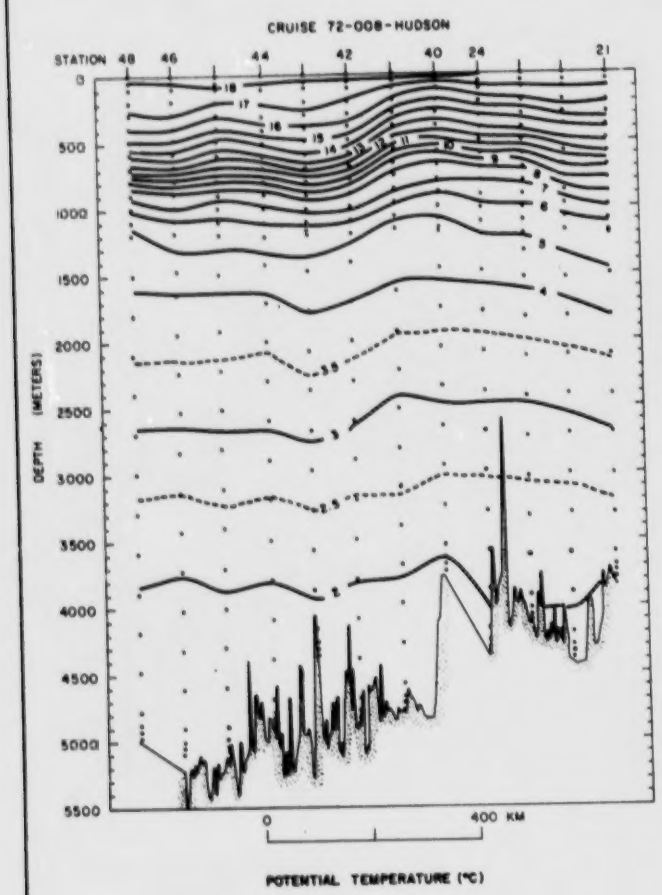

CRUISE 72-008-HUDSON
STATION 30 27 24
DEPTH (METERS)
0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500
0 400 KM
SALINITY (p.p.t.)

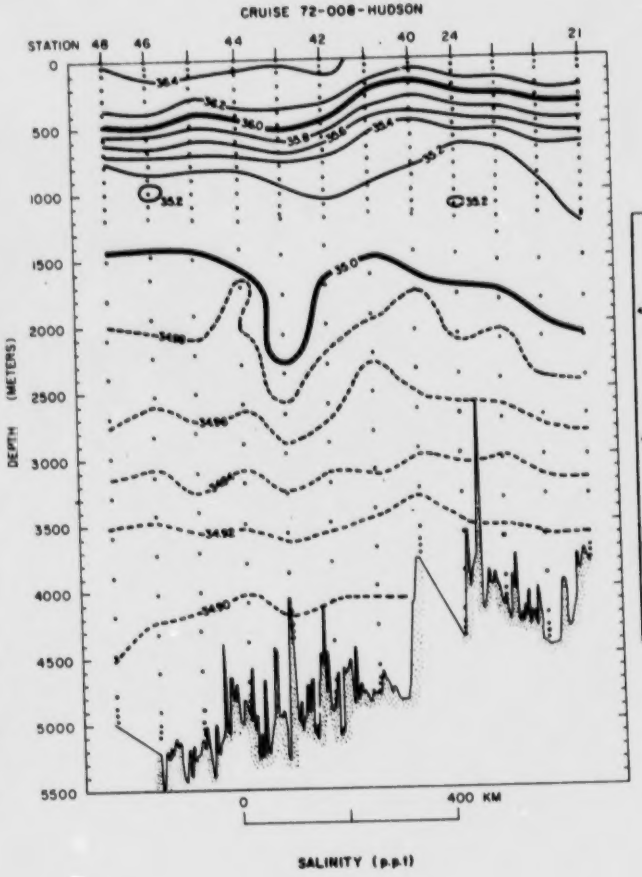

CRUISE 72-008-HUDSON
STATION 30 27 24
DEPTH (METERS)
0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500
0 400 KM
OXYGEN (ml/l)

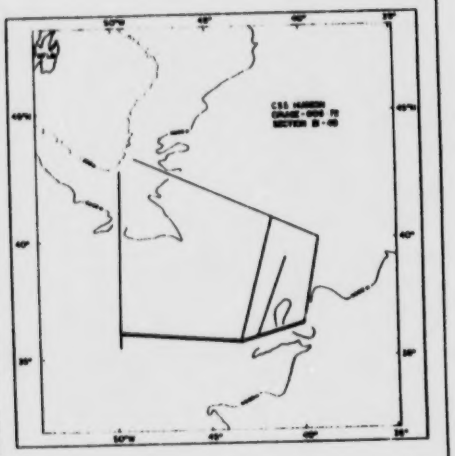


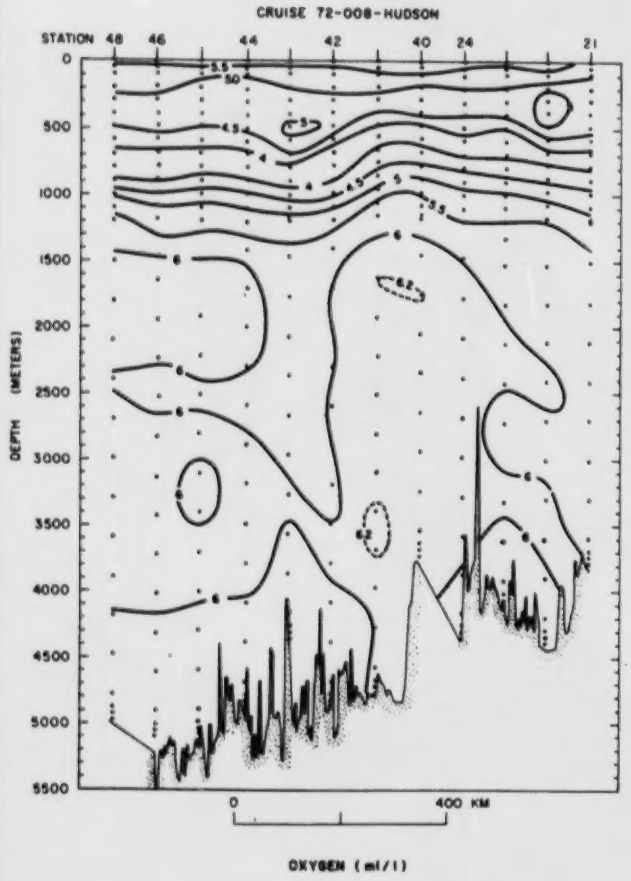

CRUISE 72-008-HUDSON
STATION 30 27 24
DEPTH (METERS)
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
0
400 KM
SILICATE (µg-at/l)

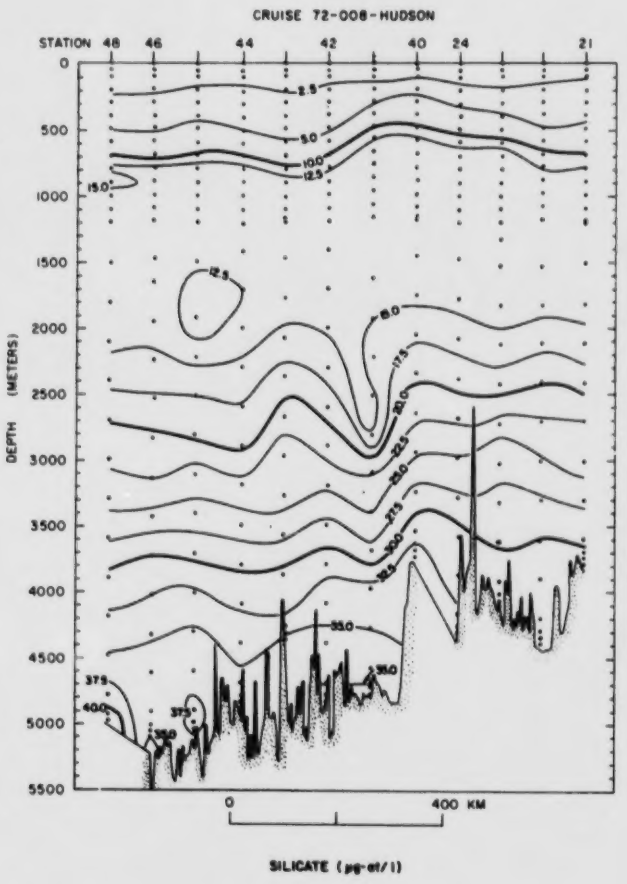

CRUISE 72-008-HUDSON
STATION 30 27 24
DEPTH (METERS)
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
0
400 KM
PHOSPHATE (µg-at/l)

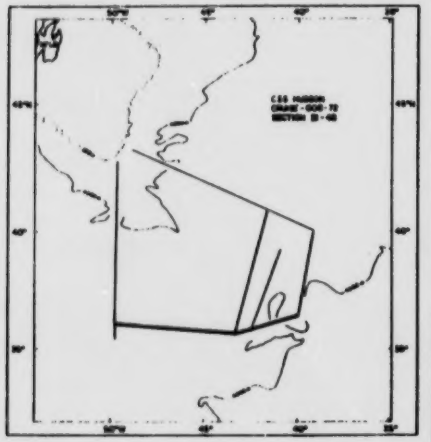

CRUISE 72-008-HUDSON
STATION 48 46 44 42 40 24 21
DEPTH (METERS)
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
0
400 KM
POTENTIAL TEMPERATURE (°C)

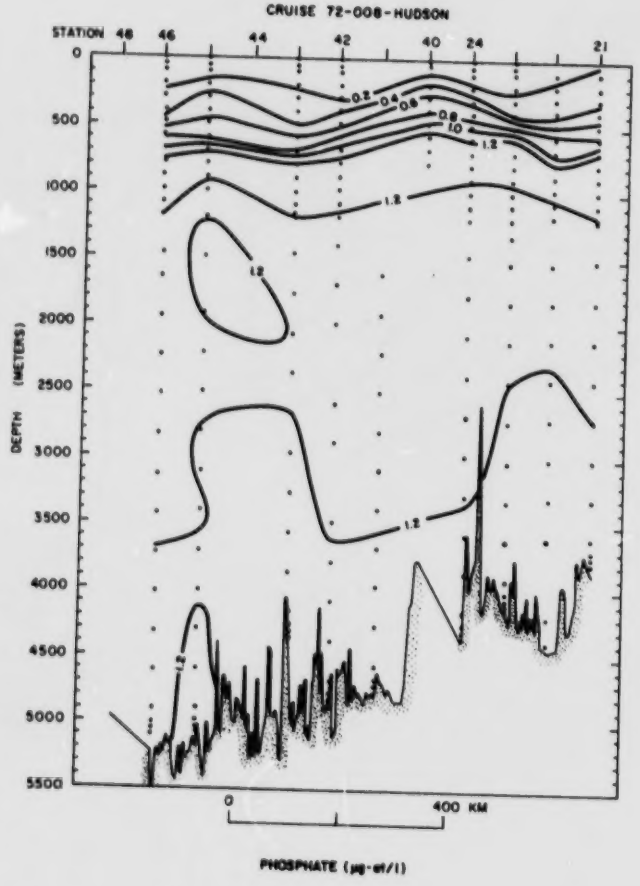

CRUISE 72-008-HUDSON
STATION 48 46 44 42 40 24 21
DEPTH (METERS)
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
0
400 KM
SALINITY (p.p.t)

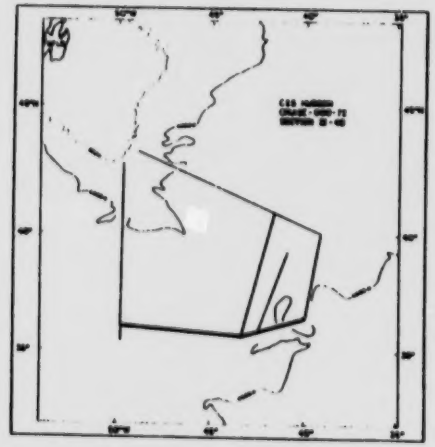


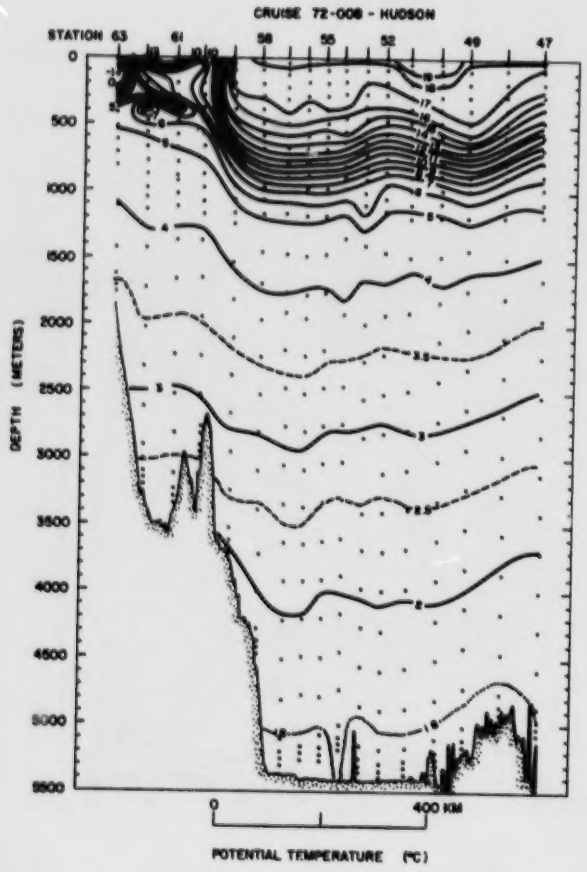

CRUISE 72-008-HUDSON
STATION 48 46 44 42 40 24 21
DEPTH (METERS)
0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500
0 400 KM
OXYGEN (ml/l)

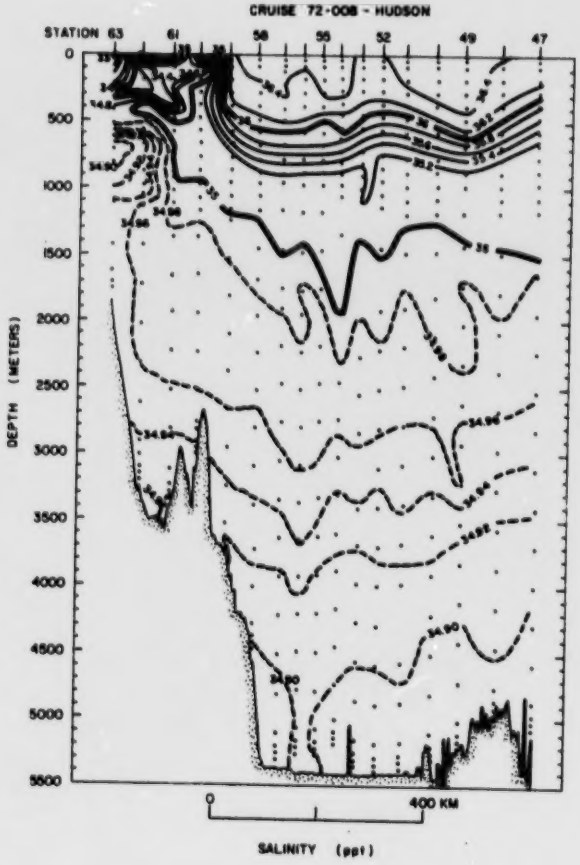

CRUISE 72-008-HUDSON
STATION 48 46 44 42 40 24 21
DEPTH (METERS)
0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500
0 400 KM
SILICATE (µg-at/l)

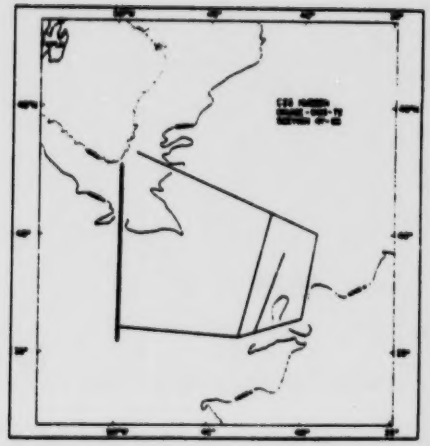


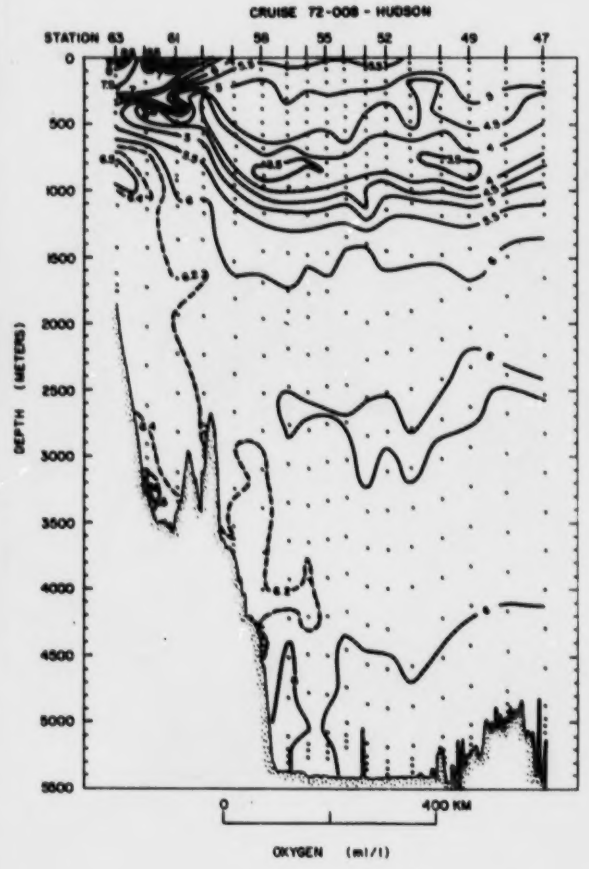

CRUISE 72-008-HUDSON
STATION 48 46 44 42 40 24 21
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
DEPTH (METERS)
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.2
1.2
0
400 KM
PHOSPHATE (µg-at/l)

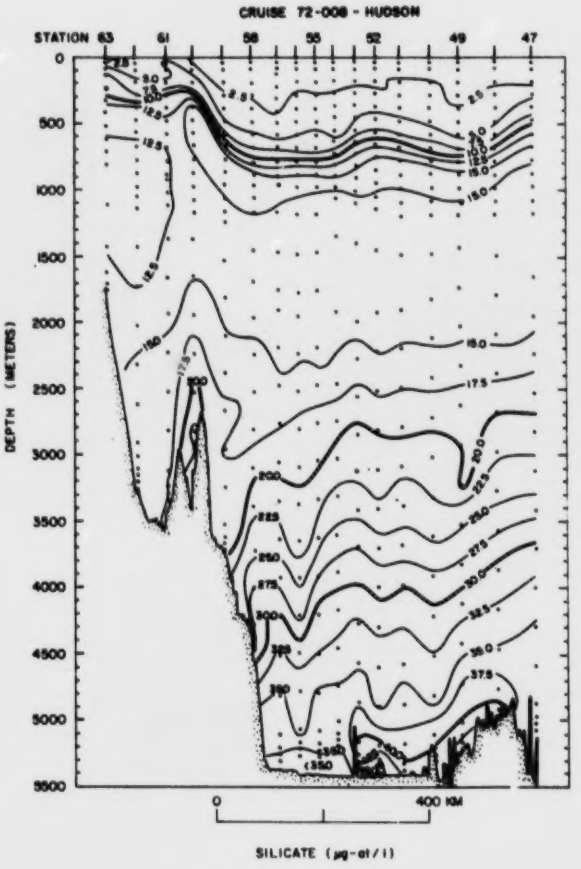


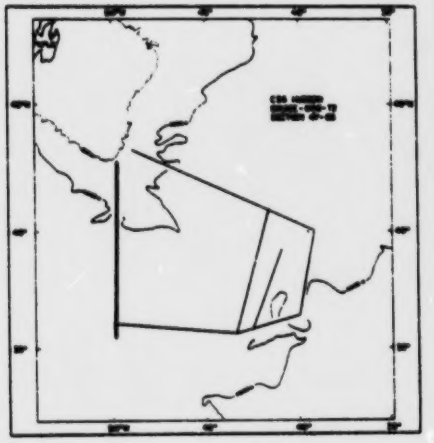

CRUISE 72-008 - HUDSON
STATION 63
61
58
55
52
49
47
DEPTH (METERS)
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
0
400 KM
POTENTIAL TEMPERATURE (°C)

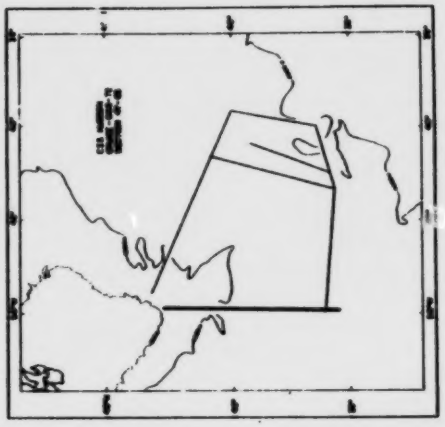

CRUISE 72-008 - HUDSON
STATION 63
61
58
55
52
49
47
DEPTH (METERS)
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
0
400 KM
SALINITY (ppt)

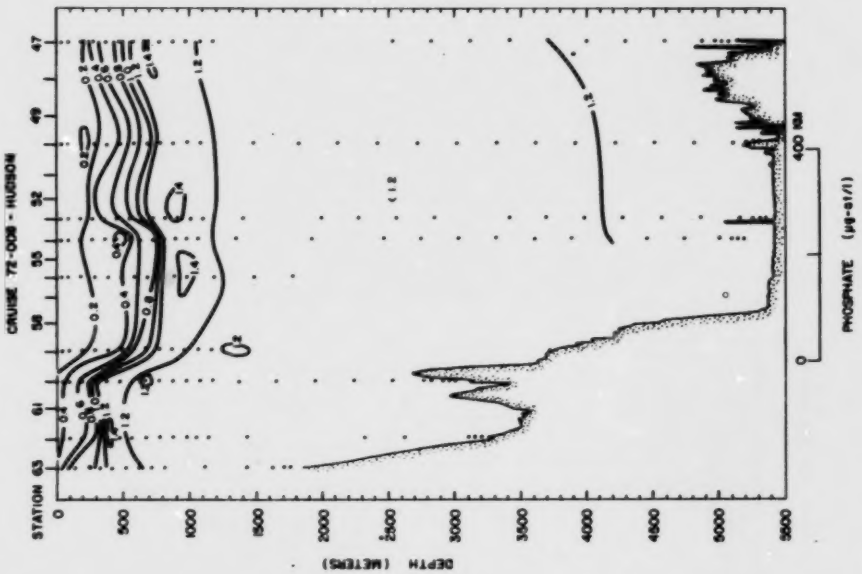


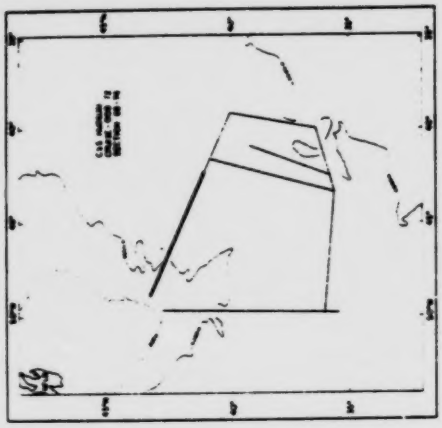

CRUISE 72-008 - HUDSON
STATION 63
61
58
55
52
49
47
DEPTH (METERS)
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
0
400 KM
OXYGEN (ml/l)

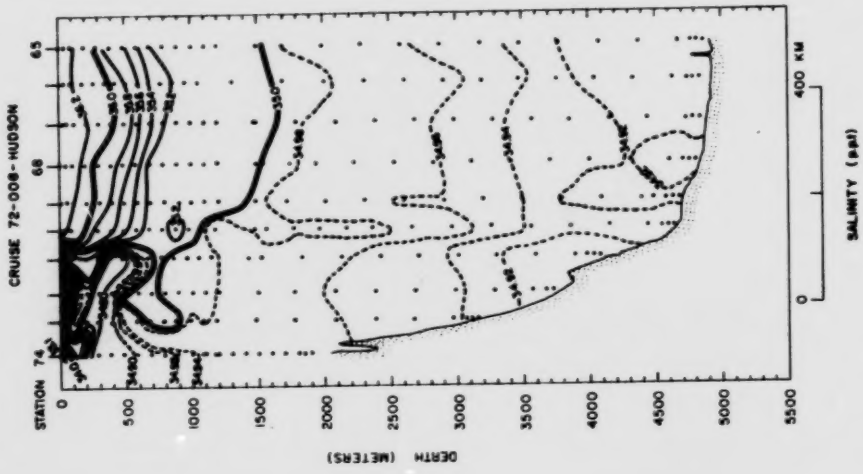

CRUISE 72-008 - HUDSON
STATION 63
61
58
55
52
49
47
DEPTH (METERS)
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
0
400 KM
SILICATE (µg-at/l)

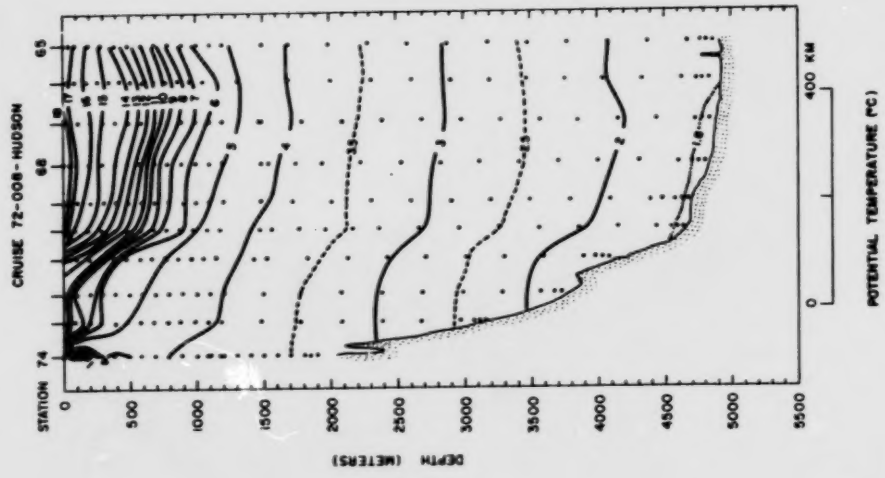


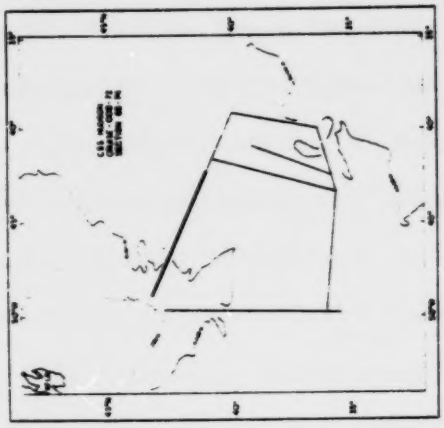


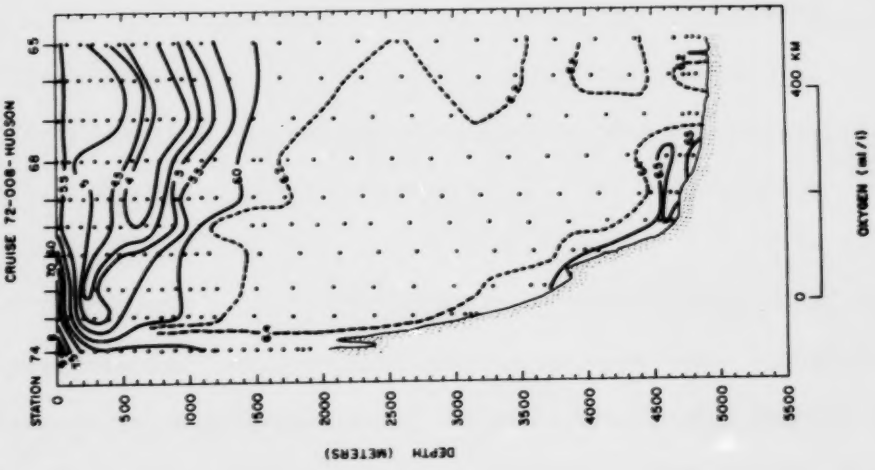

CRUISE 72-008 - HUDSON
STATION 63
61
58
55
52
49
47
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
DEPTH (METERS)
400 KM
0
PHOSPHATE (µg-at/l)




CRUISE 72-008-HUDSON
STATION 74
65
68
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
DEPTH (METERS)
0
400 KM
SALINITY (ppt)


CRUISE 72-008-HUDSON
STATION 74
65
68
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
DEPTH (METERS)
0
400 KM
POTENTIAL TEMPERATURE (°C)




CRUISE 72-008-HUDSON
STATION 74
65
68
70
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
DEPTH (METERS)
400 KM
0
OXYGEN (ml/l)

CURRENTS

The currents were measured using the film recording Braincon model 381 current meter. The instruments recorded one exposure every 20 minutes. The film was read manually, and transferred to computer compatible magnetic tape. All graphs were computer produced and plotted on an incremental plotter.

The accuracy of the measurements are (a) current speed ±1 cm /sec for the deeper meters, (b) current direction ±5° which includes the error due to the variation found in the compass swings before and after deployment.

DATA PRESENTATION

For each current meter record, data are presented on a single page in the form of:

(1) statistical summary and joint distribution.

(2) time series plot.

(3) progressive vector plot.

(4) stick plot.

STATISTICAL SUMMARY AND JOINT DISTRIBUTION

Statistics - The statistical parameters for each current meter are calculated from the raw data (20 minute sampling interval) and are expressed as U (positive east) and V (positive north). The minimum, maximum, and mean are common measures of the location of a distribution. The standard deviation and variance give an indication of the spread of a distribution. For normal or moderately skewed distributions approximately 68% of the observations will

fall within one standard deviation, 95.5% will be within two standard deviations, and better than 99.5% of the observations will lie within three standard deviations from the mean. The trend and intercept are determined by fitting the data to an equation of the form (mt + b) using a linear regression. The trend is simply the slope of the best fit line, the intercept is evaluated for the first sample and time in units of seconds.

Joint Distributions - The joint distribution table describes the percentage occurrence the data falls into bins defined by bands of speed and direction. In the tables presented here the direction and rate bandwidths are 20° and 5 cm/s. A sample is included in a band if it is equal to or greater than the lower limit, and less than the upper limit. Extreme bands which do not contain any occurrences are dropped, and any bins containing occurrences, but which represent less than 0.1% of the total are reported as 0.0%. Empty bins are left blank. The actual number of occurrences in any given band is reported as a subtotal.

TIME SERIES PLOTS

Data for the Rate, Direction, U and V component time series plots were obtained by smoothing the measured data over a three hour period. The time axis is in units of days with labels every five days and tick marks every 2.5 days. The day number is the G.M.T. day of the year. The vertical scales are in units of cm/s for speed and degrees true for direction.

PROGRESSIVE VECTOR PLOTS

These diagrams are constructed by vectorially adding consecutive data points so as to create the path that a particle would follow if always under the influence of the measured current. The data used for these plots are the same smoothed data used in the time plots. The path is marked every five days by a + sign and the year day number is labelled every ten days. An arrow in the corner of each plot indicates true north.

STICK PLOTS

The stick plots were constructed with data that had been smoothed with a filter having a cut-off period of 24 hours and subsampled every three hours. The reason for choosing this combination of filter and decimation ratio is purely a visual one. The low frequency motion seemed to be well described and the higher frequencies (tidal and beyond) are removed. Too many data points or sticks make a confused picture whereas too few make the change of velocity hard to follow from one vector to another.

Each stick in the plot is the vector described by the rate and direction data for the time indicated on the horizontal axis at the vector's origin. The time scale is not necessarily the same as that for the rate and direction plots and the amplitude scales may not be the same from one stick plot to another.

The direction of true north is given by an arrow in the corner of each plot frame. The coordinate systems alternate between "north up" and "east up" depending on the predominant current direction in each frame.

CURRENT METER DATA

Stn.	Depth	Position Lat	Long	Data Period	From 1972		To 1972	
1.	1300	42°31'N	49°44'W	49D 16h 20m	16.35	17 April	08.55	6 June
1.	2500	42°31'N	49°44'W	45D 20h 20m	16.45	17 April	13.05	2 June
2.	2900	42°00'N	49°43'W	47D 4h 20m	14.20	16 April	18.40	2 June
15.	750	43°08'N	48°26'W	48D 8h 20m	18.05	18 April	02.25	6 June
15.	1750	43°08'N	48°26'W	39D 4h 20m	18.00	18 April	22.20	27 May
17.	2750	43°32'N	46°34'W	42D 4h 20m	19.33	22 April	23.55	3 June
17.	3500			27D 12h 20m	19.30	22 April	07.50	20 May
18.	2750	42°20'N	45°48'W	39D 20h 20m	14.40	24 April	11.00	3 June
18.	3500	42°20'N	45°48'W	39D 20h 20m	14.40	24 April	11.00	3 June
18.	4250	42°20'N	45°48'W	40D 4h 20m	14.30	24 April	18.50	3 June
19.	3250	42°08'N	45°17'W	39D 12h 20m	02.30	25 April	14.50	3 June
19.	3750	42°08'N	45°17'W	39D 16h 20m	19.45	24 April	12.05	3 June
20.	4150	41°48'N	44°30'W	38D 16h 20m	14.35	25 April	12.05	3 June
20.	4650	41°48'N	44°30'W	38D 16h 20m	14.25	25 April	06.45	3 June
21.	4650	41°32'N	43°42'W	37D 16h 20m	20.15	25 April	12.35	2 June
22.	4250	41°17'N	42°49'W	21D 0h 20m	14.30	26 April	14.50	17 April
22.	4750	41°17'N	42°49'W	36D 16h 20m	14.20	26 April	06.40	2 June

Depth in Metres. G.M.T. Time.

VELOCITIES RESOLVED ALONG 0. DEG. TRUE

CHAN	NAME	UNIT	NUMBER	MIN	MAX	MEAN	INTERCEPT	TREND(/SEC)	VARIANCE	STD. DEV.
1	U(1,1300M)	MM/S	3576	-.2047E+03	.1686E+03	-.1624E+01	-18.434	-.78278E-05	.37108E+04	.57065E+02
2	V(1,1300M)	MM/S	3576	-.2183E+03	.1079E+03	-.4332E+02	-8.128	-.16397E-04	.56236E+04	.51221E+02

R(1,1300M) VS D(1,1300M)

DEG.TRUE	MM/S	SUB TOTAL	OUT OF RANGE	0.00 TO 50.00	50.00 TO 100.00	100.00 TO 150.00	150.00 TO 200.00	200.00 TO 250.00
340.00 TO	360.00	25	*	.5	.1	.1		
320.00 TO	340.00	13	*	.3	.1			
300.00 TO	320.00	11	*	.3				
280.00 TO	300.00	14	*	.1	.1	.1		
260.00 TO	280.00	68	*	.4	.6	.4	.4	.1
240.00 TO	260.00	199	*	1.8	2.0	1.1	.6	.2
220.00 TO	240.00	436	*	3.0	4.7	3.2	1.3	
200.00 TO	220.00	388	*	3.9	5.4	1.1	.5	
180.00 TO	200.00	445	*	4.8	4.9	2.3	.4	.1
160.00 TO	180.00	521	*	5.3	4.5	2.9	1.6	.3
140.00 TO	160.00	440	*	3.6	3.9	2.9	1.1	.8
120.00 TO	140.00	197	*	1.5	1.1	1.3	1.6	.0
100.00 TO	120.00	110	*	2.3	.8	.0	.0	
80.00 TO	100.00	185	*	3.4	1.8			
60.00 TO	80.00	217	*	4.4	1.7			
40.00 TO	60.00	168	*	4.0	.7			
20.00 TO	40.00	97	*	2.3	.4			
0.00 TO	20.00	42	*	.9	.2	.0		
OUT OF RANGE		0	0					
SUB TOTAL		3576	0	1525	1184	546	273	48

STATION 1 1300 m

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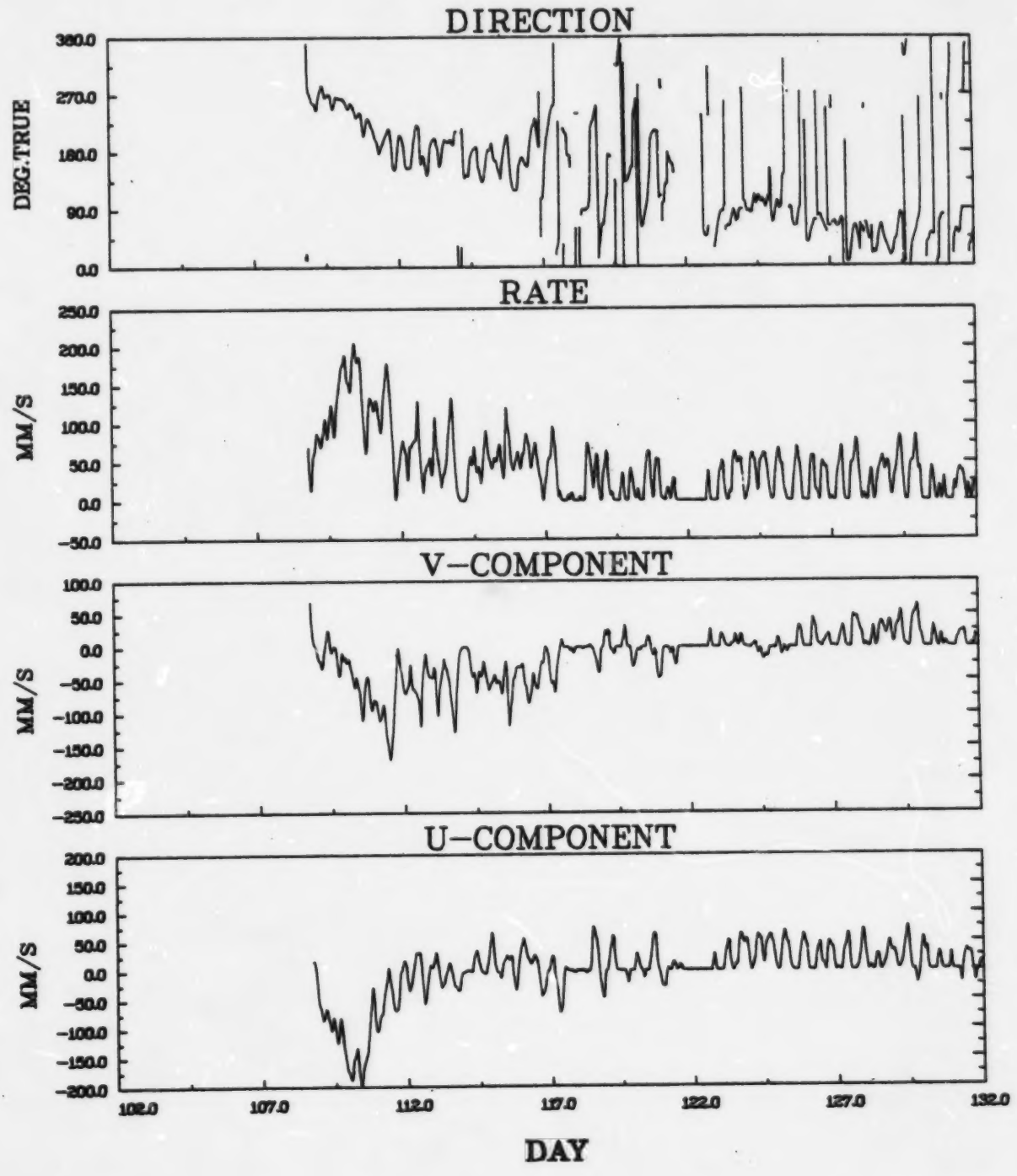
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180.0
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RATE
MM/S
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150.0
100.0
50.0
0.0
-50.0
V-COMPONENT
MM/S
100.0
50.0
0.0
-50.0
-100.0
-150.0
-200.0
-250.0
U-COMPONENT
MM/S
200.0
150.0
100.0
50.0
0.0
-50.0
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-200.0
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112.0
117.0
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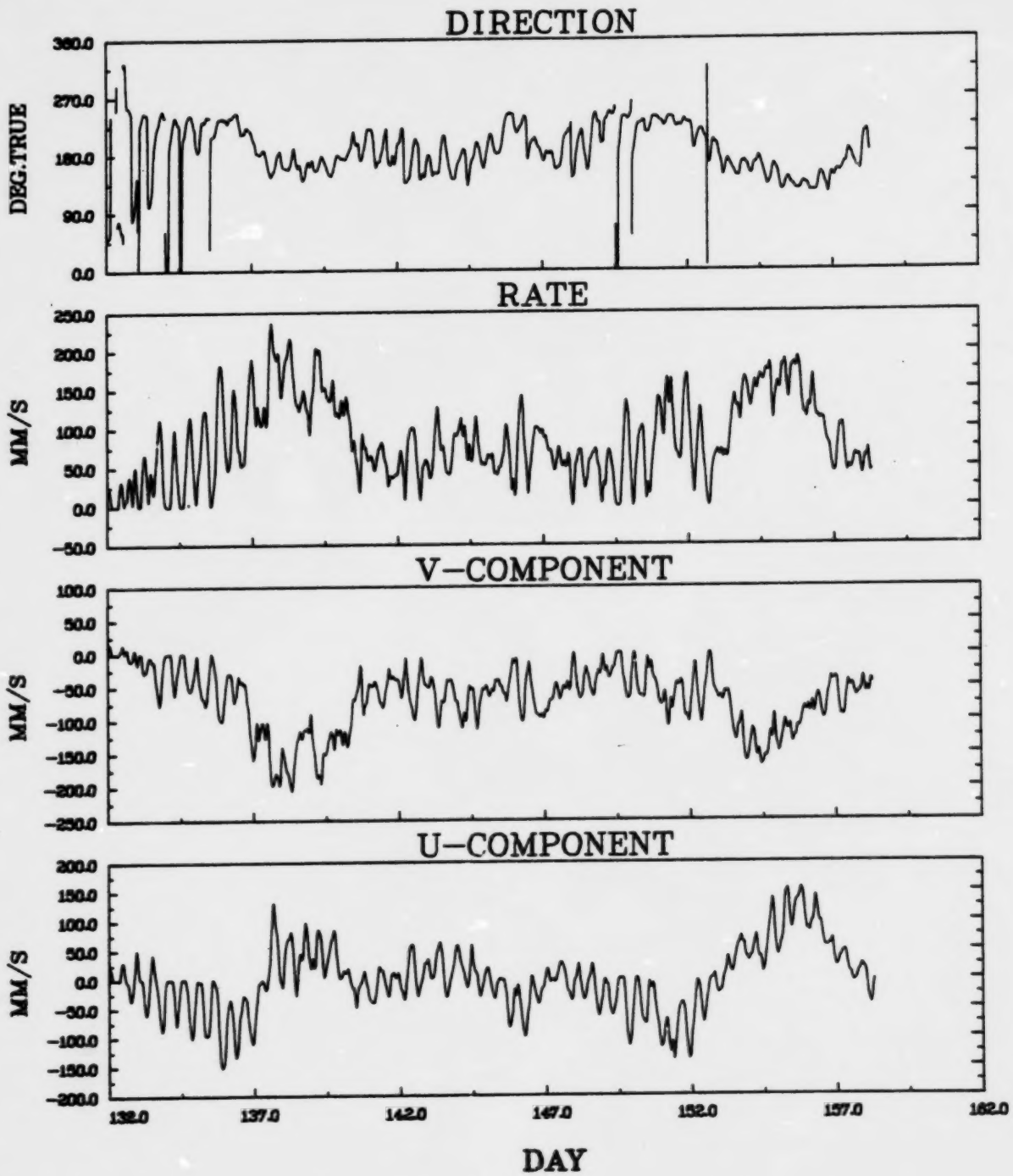
127.0
132.0
DAY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180.0
90.0
0.0
RATE
MM/S
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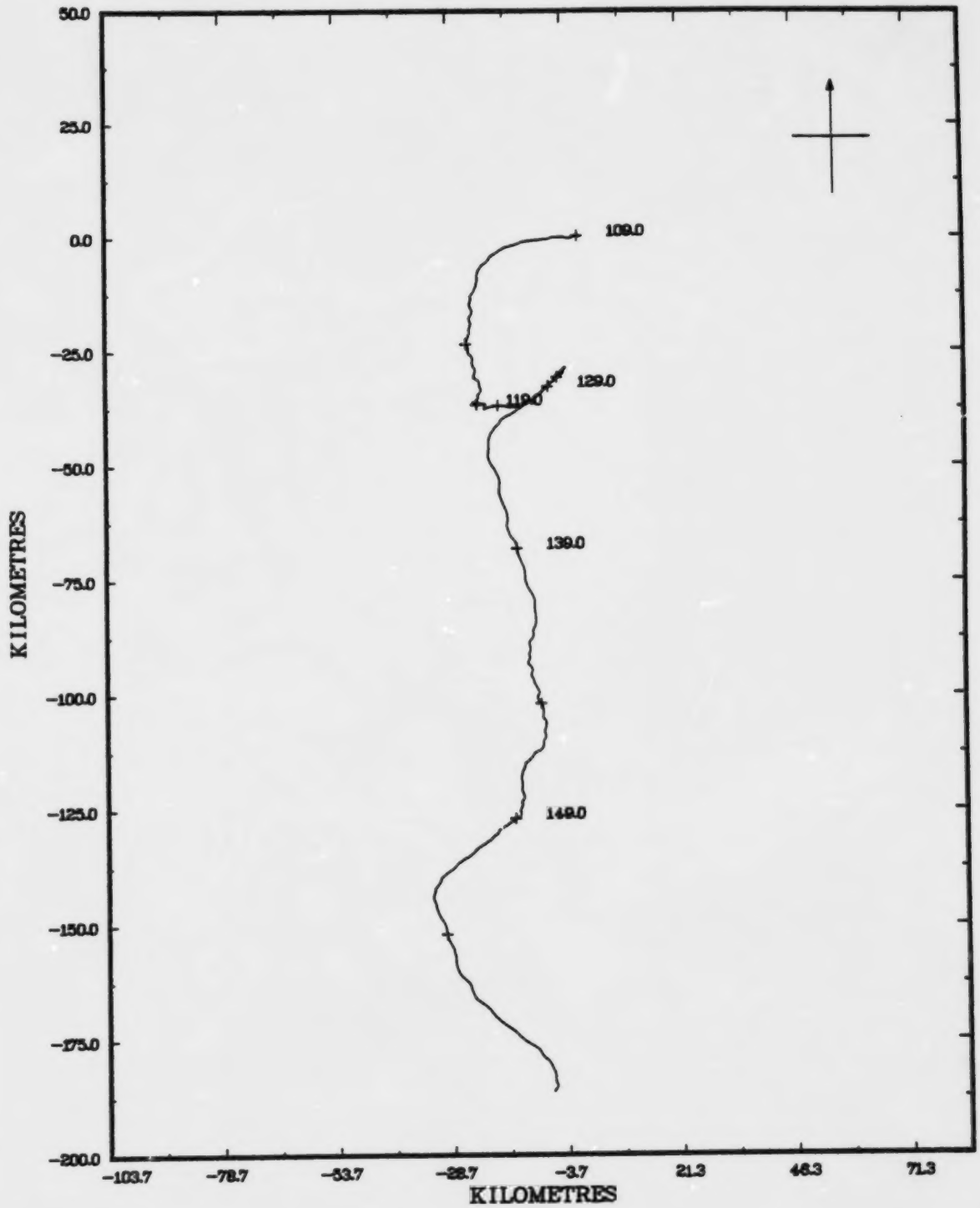
200.0
150.0
100.0
50.0
0.0
-50.0
V-COMPONENT
MM/S
100.0
50.0
0.0
-50.0
-100.0
-150.0
-200.0
-250.0
U-COMPONENT
MM/S
200.0
150.0
100.0
50.0
0.0
-50.0
-100.0
-150.0
-200.0
132.0
137.0
142.0
147.0
152.0
157.0
162.0
DAY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-50.0
-75.0
-100.0
-125.0
-150.0
-175.0
-200.0
KILOMETRES
109.0
129.0
119.0
139.0
149.0
-103.7
-78.7
-53.7
-28.7
-3.7
21.3
46.3
71.3
KILOMETRES

MM/S
-2000
-1500
-1000
-500
0
500
1000
1500
2000
1370
1320
1270
1220
1170
1120
1070
970
MM/S
-2000
-1500
-1000
-500
0
500
1000
1500
2000
1370
1320
1270
1220
1170
1120
1070
970
DAY

VELOCITIES RESOLVED ALONG 0. DEG. TRUE

CHAN		NAME	UNIT	NUMBER	MIN	MAX	MEAN	INTERCEPT	TREND(/SEC)	VARIANCE	STD. DEV.
1	U(	1,2500M)	MM/S	3300-	-.1832E+03	.1022E+03	-.1823E+02	-47.598	.14827E-04	.20606E+04	.45394E+02
2	V(	1,2500M)	MM/S	3300-	-.1753E+03	.8008E+02	-.1580E+02	-27.178	.5742RE-05	.10163E+04	.31879E+02

P(1,2500M) VS D(1,2500M)

MM/S DEG.TRUE		SUB TOTAL	OUT OF RANGE	0.00 TO 50.00	50.00 TO 100.00	100.00 TO 150.00	150.00 TO 200.00	200.00 TO 250.00
340.00 TO	360.00	44	*	1.1	.2			
320.00 TO	340.00	54	*	1.5	.2			
300.00 TO	320.00	88	*	2.3	.3			
280.00 TO	300.00	134	*	3.0	1.1			
260.00 TO	280.00	269	*	4.0	3.5	.6	.1	
240.00 TO	260.00	544	*	6.5	5.9	3.3	.8	.1
220.00 TO	240.00	488	*	5.8	5.2	2.5	1.1	.1
200.00 TO	220.00	261	*	4.3	2.3	1.0	.3	.1
180.00 TO	200.00	189	*	4.3	1.1	.3	.1	
160.00 TO	180.00	168	*	4.3	.7	.1		
140.00 TO	160.00	176	*	4.8	.5			
120.00 TO	140.00	155	*	4.3	.4			
100.00 TO	120.00	204	*	5.0	1.2	.0		
80.00 TO	100.00	177	*	2.9	2.4	.1		
60.00 TO	80.00	130	*	2.5	1.3	.1		
40.00 TO	60.00	98	*	2.0	.9	.1		
20.00 TO	40.00	57	*	1.2	.5			
0.00 TO	20.00	64	*	1.5	.4			
OUT OF RANGE		0	0					
SUB TOTAL		3300	0	7024	927	264	77	8

STATION 1 2500 m

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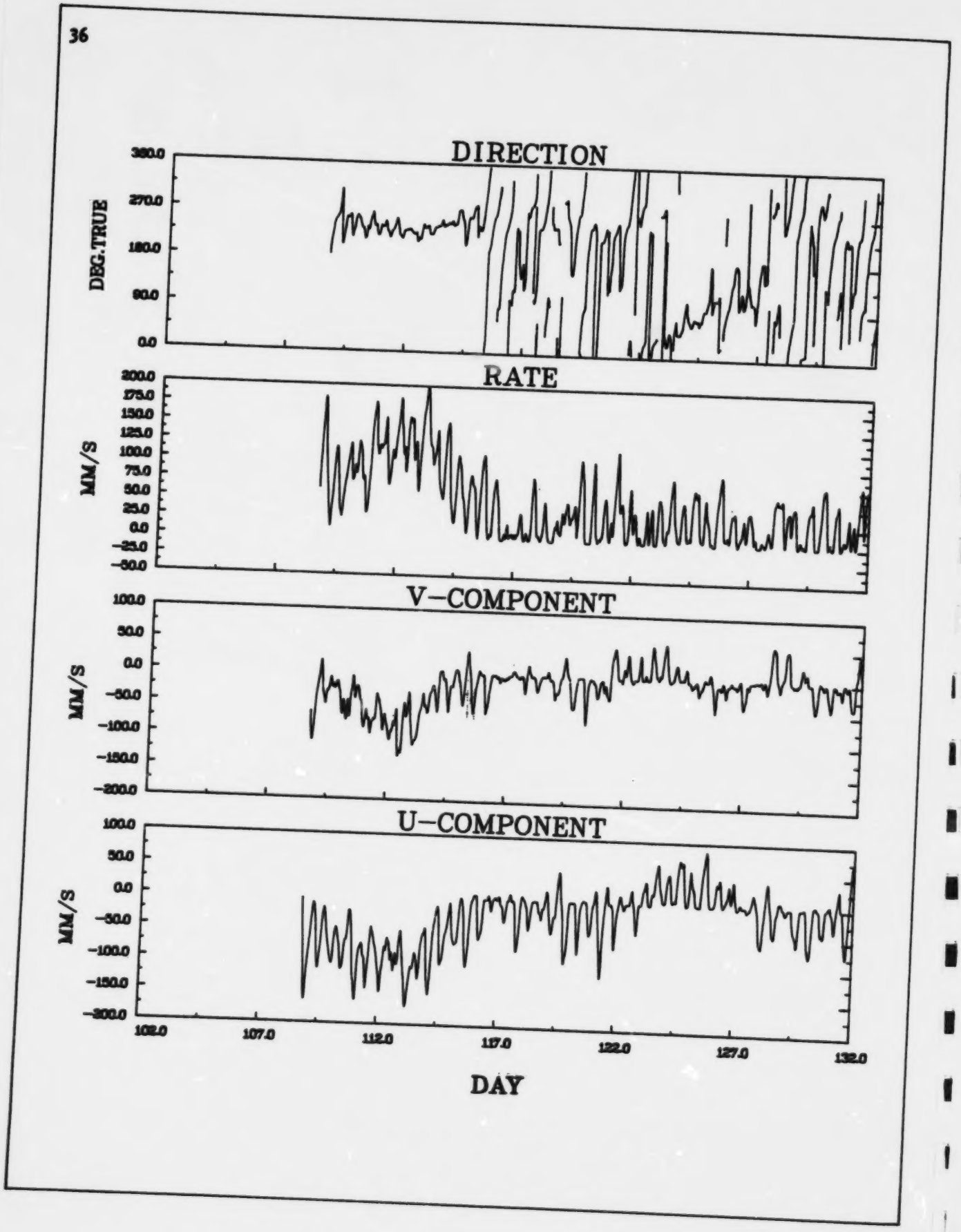
DIRECTION
DEG.TRUE
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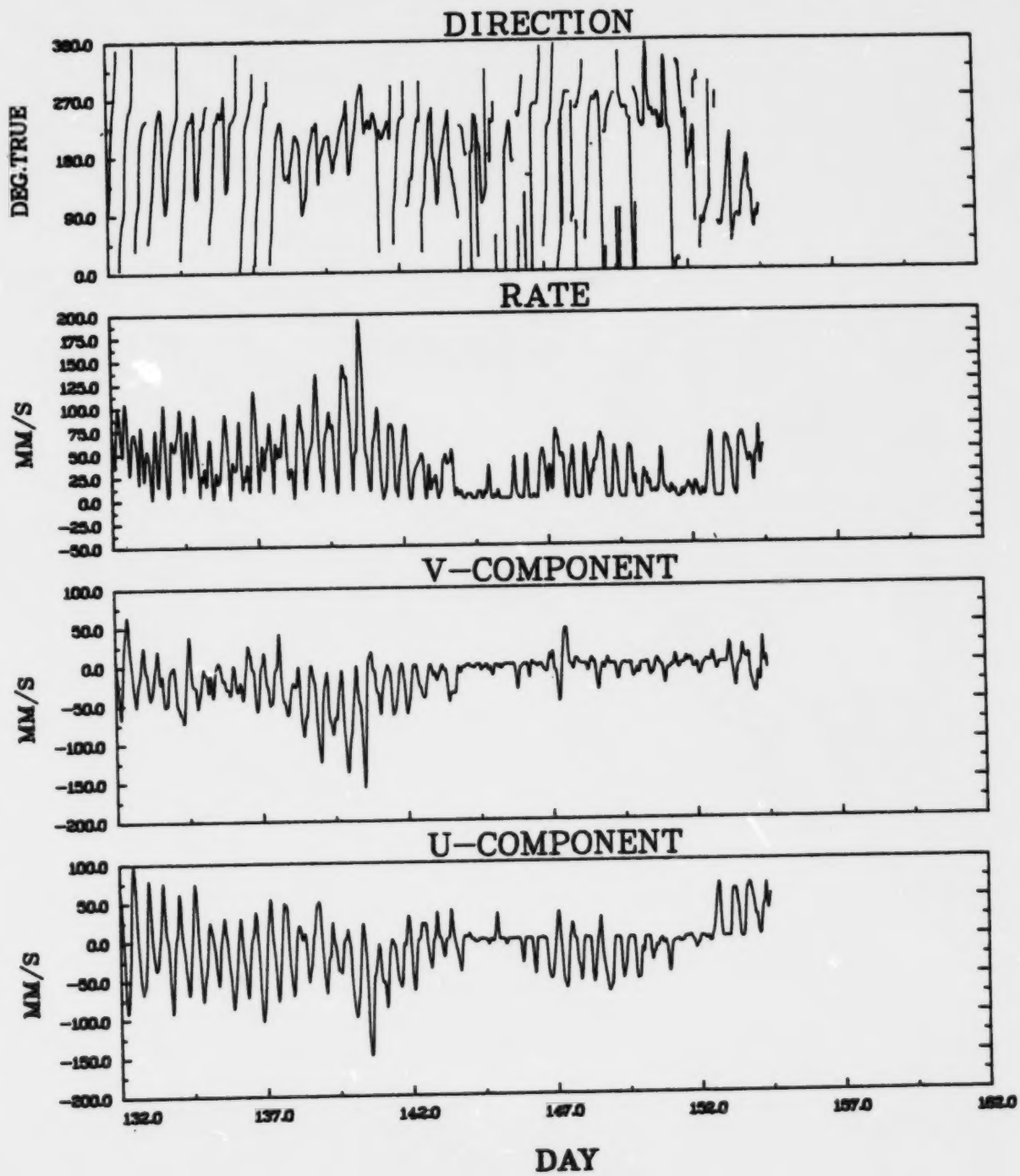
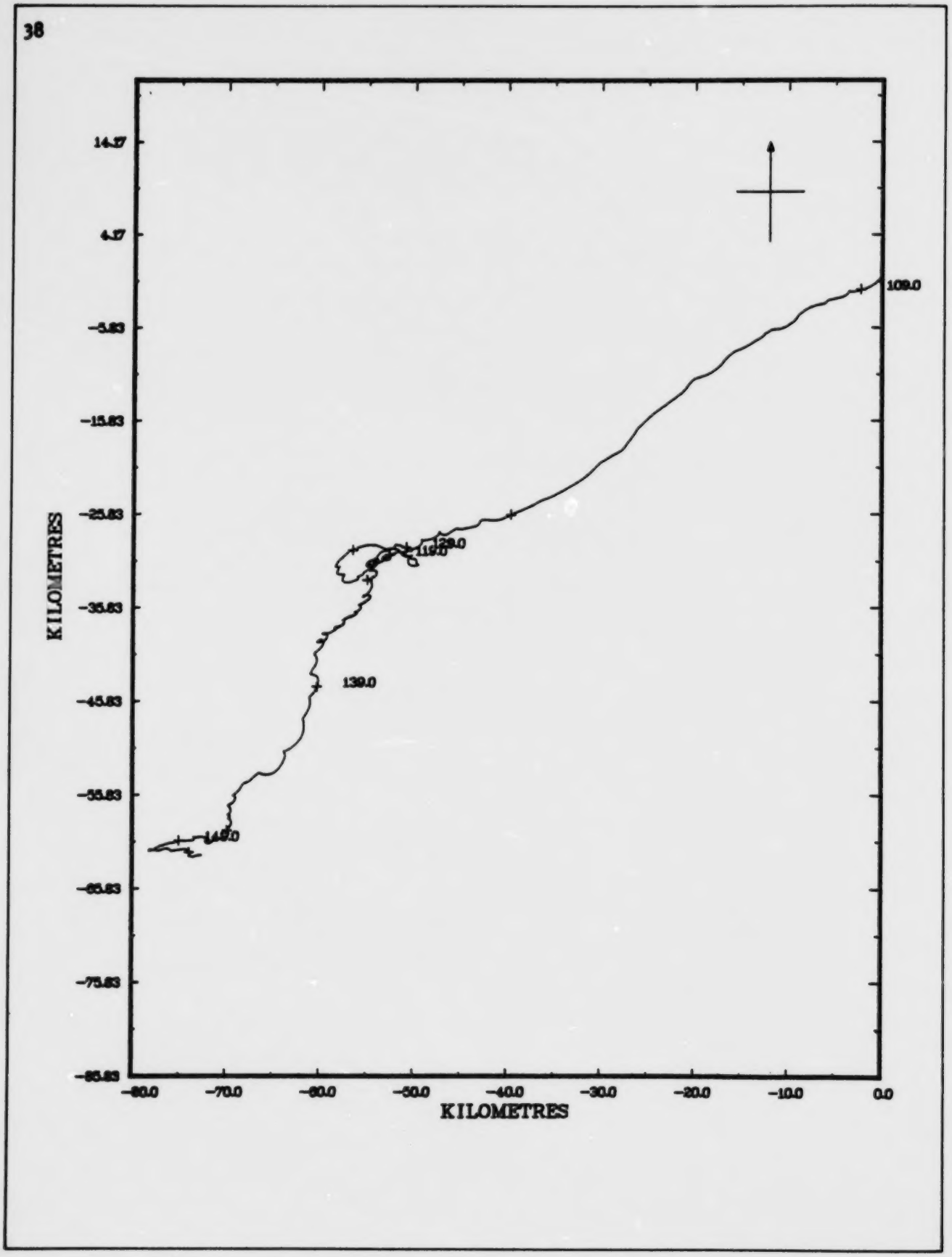
270.0
180.0
90.0
0.0
RATE
MM/S
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
-25.0
-50.0
V-COMPONENT
MM/S
100.0
50.0
0.0
-50.0
-100.0
-150.0
-200.0
U-COMPONENT
MM/S
100.0
50.0
0.0
-50.0
-100.0
-150.0
-200.0
102.0
107.0
112.0
117.0
122.0
127.0
132.0
DAY


DIRECTION
DEG.TRUE
360.0
270.0
180.0
90.0
0.0
RATE
MM/S
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
-25.0
-50.0
V-COMPONENT
MM/S
100.0
50.0
0.0
-50.0
-100.0
-150.0
-200.0
U-COMPONENT
MM/S
100.0
50.0
0.0
-50.0
-100.0
-150.0
-200.0
132.0
137.0
142.0
147.0
152.0
157.0
162.0
DAY

38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-35.83
-45.83
-55.83
-65.83
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-85.83
KILOMETRES
-80.0
-70.0
-60.0
-50.0
-40.0
-30.0
-20.0
-10.0
0.0
KILOMETRES
109.0
129.0
119.0
139.0
149.0

MM/S
-1000
-800
-600
-400
-200
0
200
400
600
800
1000
1270
1320
1370
1420
1470
1520
1570
1620
1670
DAY
MM/S
-1000
-800
-600
-400
-200
0
200
400
600
800
1000
870
920
970
1020
1070
1120
1170
1220
1270
1320
1370

VELOCITIES RESOLVED ALONG 0. DEG. TRUE

CHAN	NAME	UNIT	NUMBER	MIN	MAX	MEAN	INTERCEPT	TREND(/SEC)	VARIANCE	STD. DEV.
1	U(2,2900M)	MM/S	3396	-.2048E+03	.1775E+03	.2192E+01	-11.523	.67288E-05	.23418E+04	.48392E+02
2	V(2,2900M)	MM/S	3396	-.7283E+02	.1769E+03	.2088E+02	10.883	.49056E-05	.12992E+04	.36044E+02

P(2,2900M) VS D(2,2900M)

MM/S DEG.TRUE	SUB TOTAL	OUT OF RANGE	0.00 TO 50.00	50.00 TO 100.00	100.00 TO 150.00	150.00 TO 200.00	200.00 TO 250.00
340.00 TO 360.00	154	*	2.2	1.6	.5	.2	
320.00 TO 340.00	147	*	1.8	1.6	.7	.1	.1
300.00 TO 320.00	183	*	1.8	1.3	1.2	.9	.2
280.00 TO 300.00	172	*	2.1	1.8	.6	.3	.2
260.00 TO 280.00	245	*	3.1	2.9	1.1	.1	
240.00 TO 260.00	158	*	2.8	1.5	.4		
220.00 TO 240.00	124	*	2.5	1.1	.0		
200.00 TO 220.00	100	*	2.4	.5			
180.00 TO 200.00	48	*	1.3	.1			
160.00 TO 180.00	55	*	1.5	.1			
140.00 TO 160.00	80	*	2.1	.3			
120.00 TO 140.00	84	*	2.2	.2			
100.00 TO 120.00	130	*	3.0	.8			
80.00 TO 100.00	221	*	4.9	1.5	.0		
60.00 TO 80.00	440	*	6.4	5.7	.8	.1	.0
40.00 TO 60.00	464	*	6.0	6.4	1.1	.2	
20.00 TO 40.00	321	*	4.9	4.2	.4		
0.00 TO 20.00	270	*	4.1	2.8	.9	.1	
OUT OF RANGE	0	0					
SUB TOTAL	3396	0	1879	1173	263	60	21

STATION 2 2900 m

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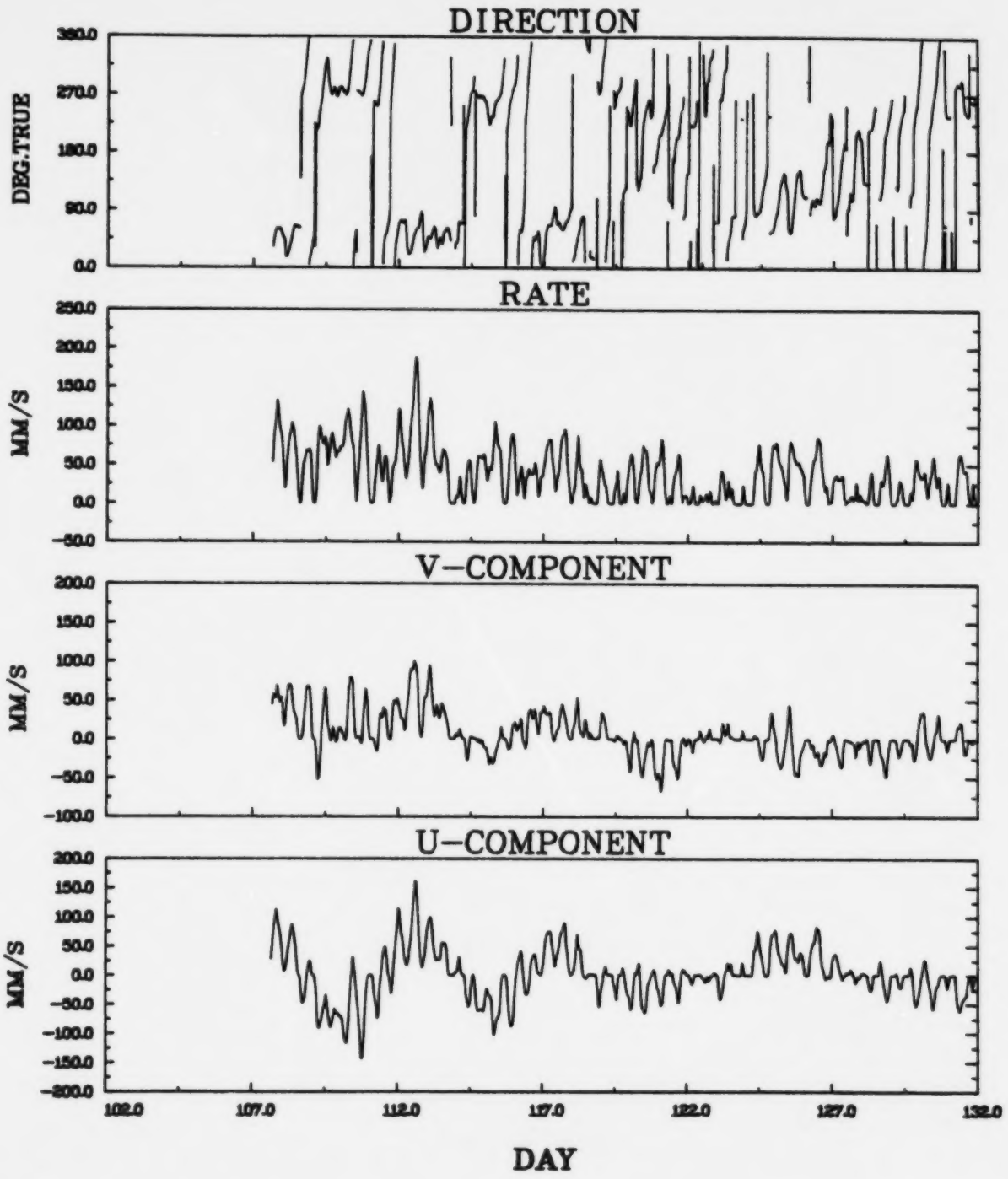
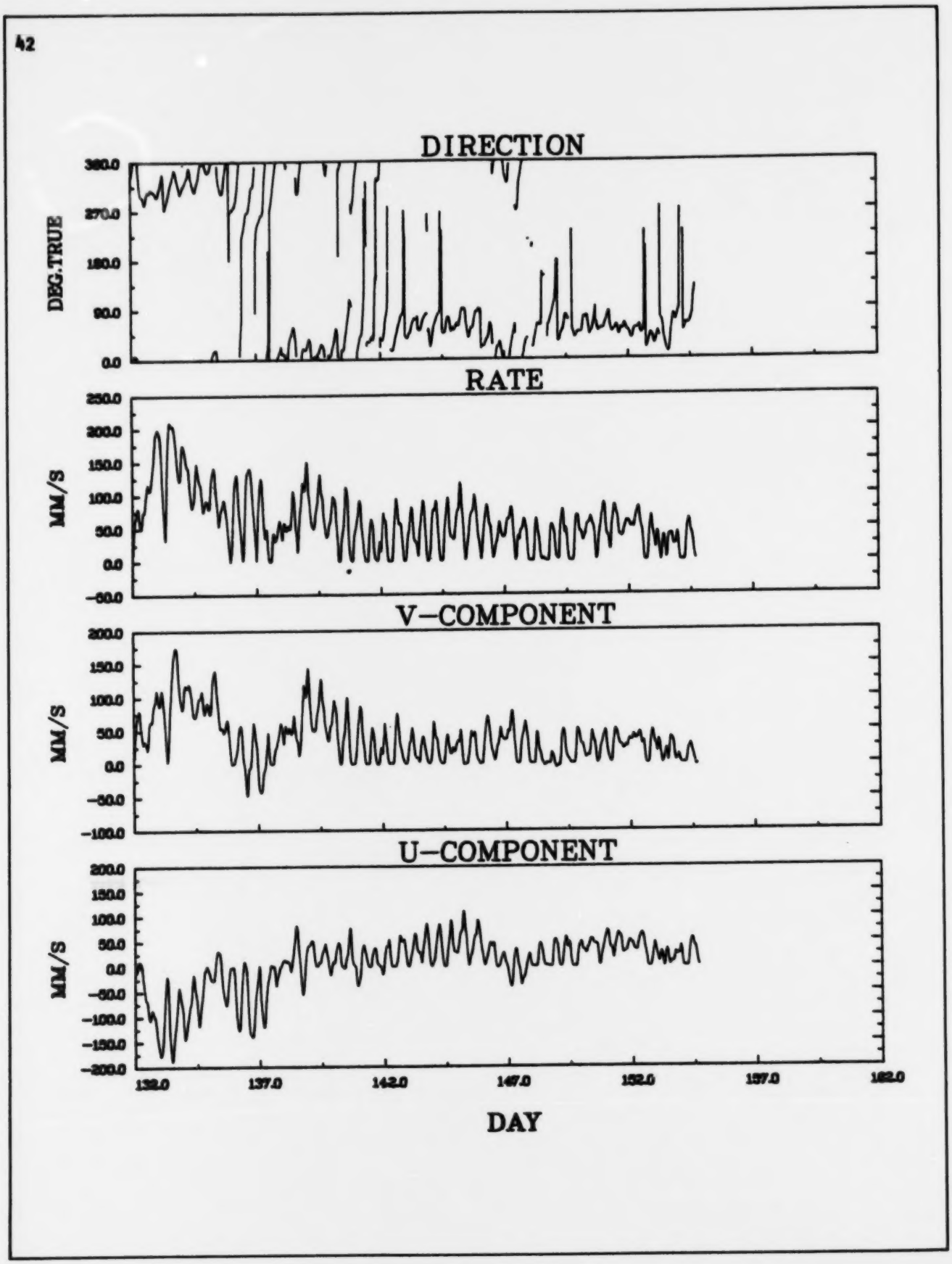
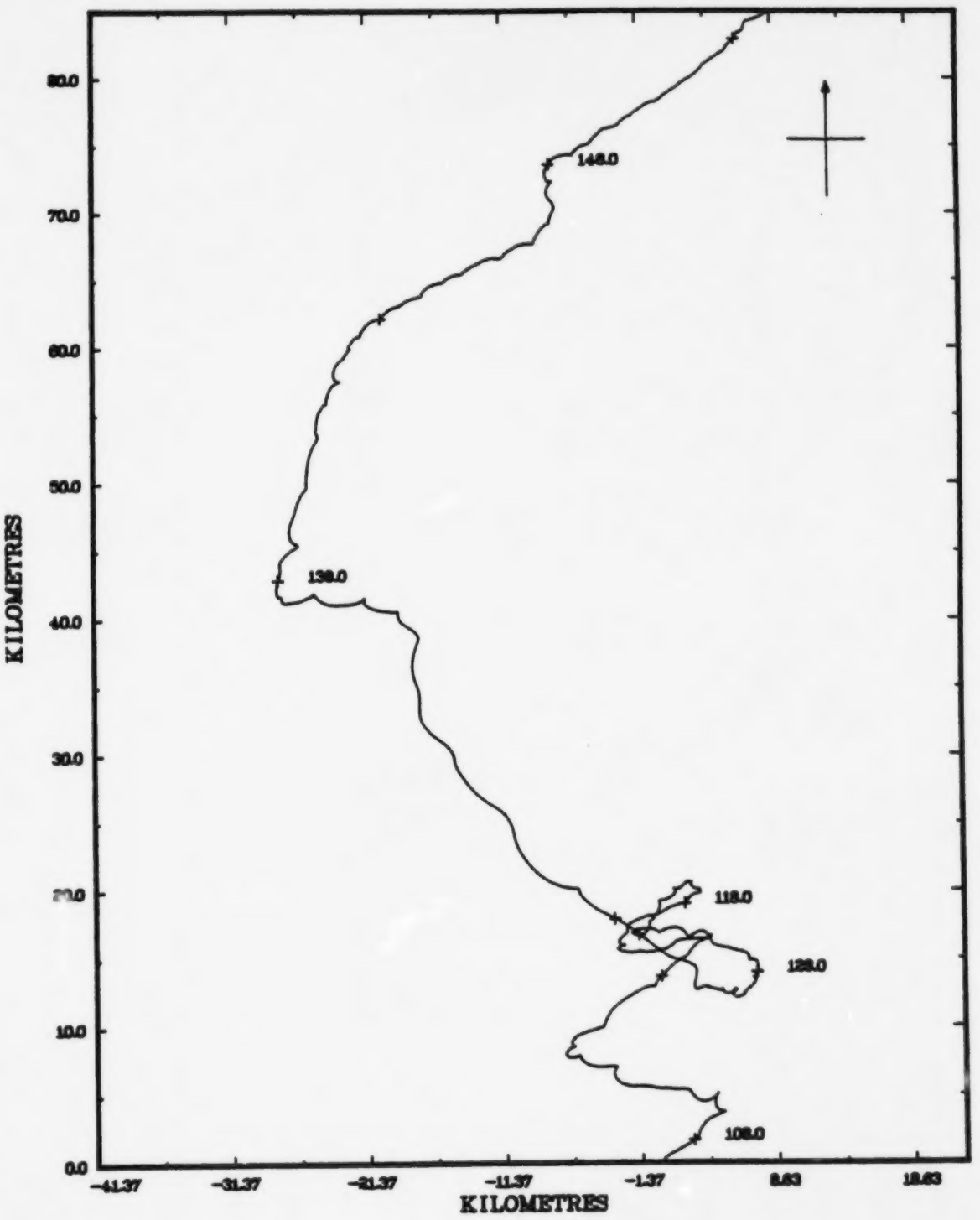

DIRECTION
DEG.TRUE
360.0
270.0
180.0
90.0
0.0
RATE
MM/S
250.0
200.0
150.0
100.0
50.0
0.0
-50.0
V-COMPONENT
MM/S
200.0
150.0
100.0
50.0
0.0
-50.0
-100.0
U-COMPONENT
MM/S
200.0
150.0
100.0
50.0
0.0
-50.0
-100.0
-150.0
-200.0
102.0
107.0
112.0
117.0
122.0
127.0
132.0
DAY


DIRECTION
DEG.TRUE
360.0
270.0
180.0
90.0
0.0
RATE
MM/S
250.0
200.0
150.0
100.0
50.0
0.0
-50.0
V-COMPONENT
MM/S
200.0
150.0
100.0
50.0
0.0
-50.0
-100.0
U-COMPONENT
MM/S
200.0
150.0
100.0
50.0
0.0
-50.0
-100.0
-150.0
-200.0
132.0
137.0
142.0
147.0
152.0
157.0
162.0
DAY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128.0
108.0
80.0
70.0
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50.0
40.0
30.0
20.0
10.0
0.0
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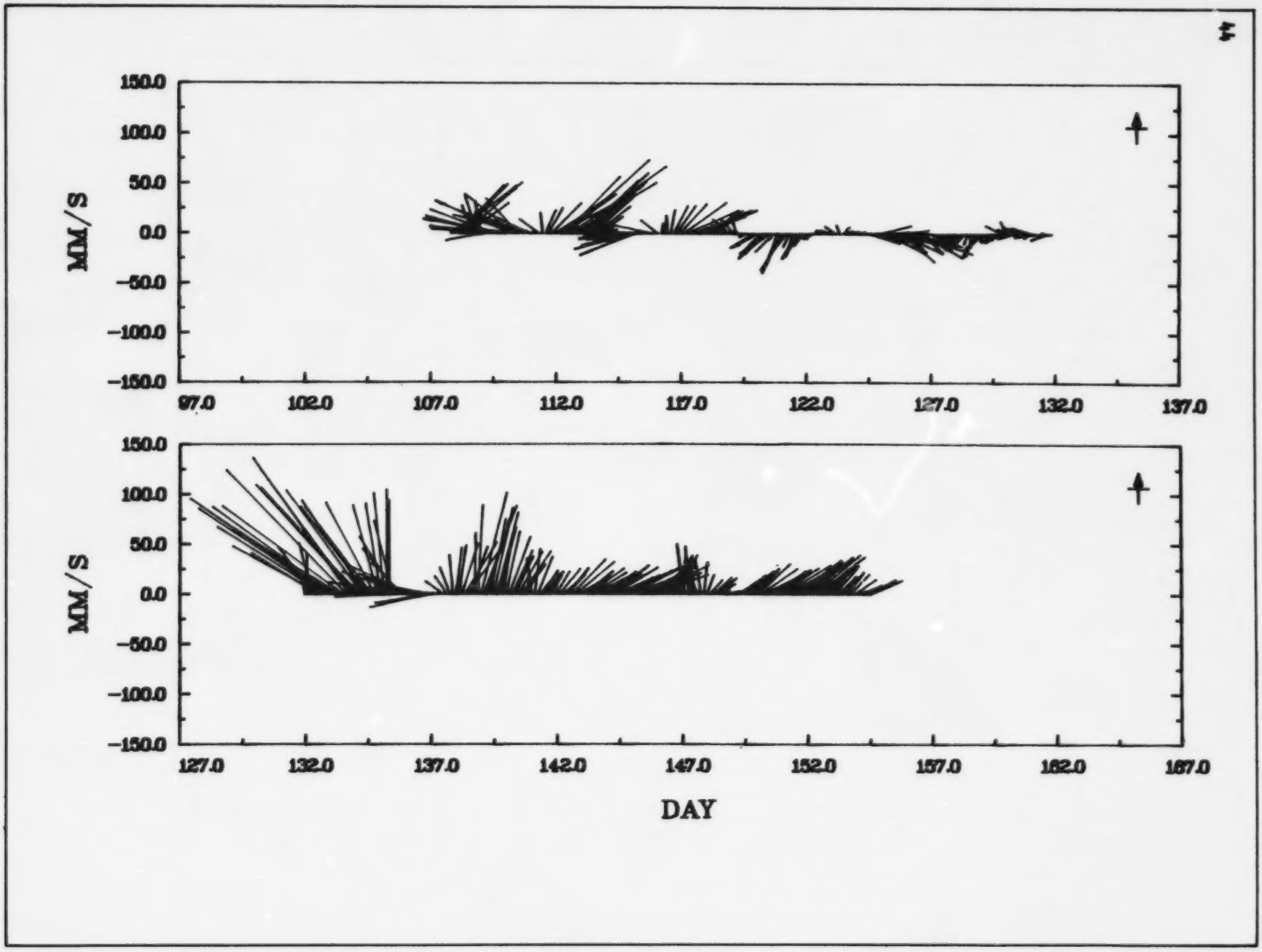
-1.37
8.63
18.63
KILOMETRES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0.0
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-150.0
MM/S
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102.0
107.0
112.0
117.0
122.0
127.0
132.0
137.0
150.0
100.0
50.0
0.0
-50.0
-100.0
-150.0
MM/S
127.0
132.0
137.0
142.0
147.0
152.0
157.0
162.0
167.0
DAY

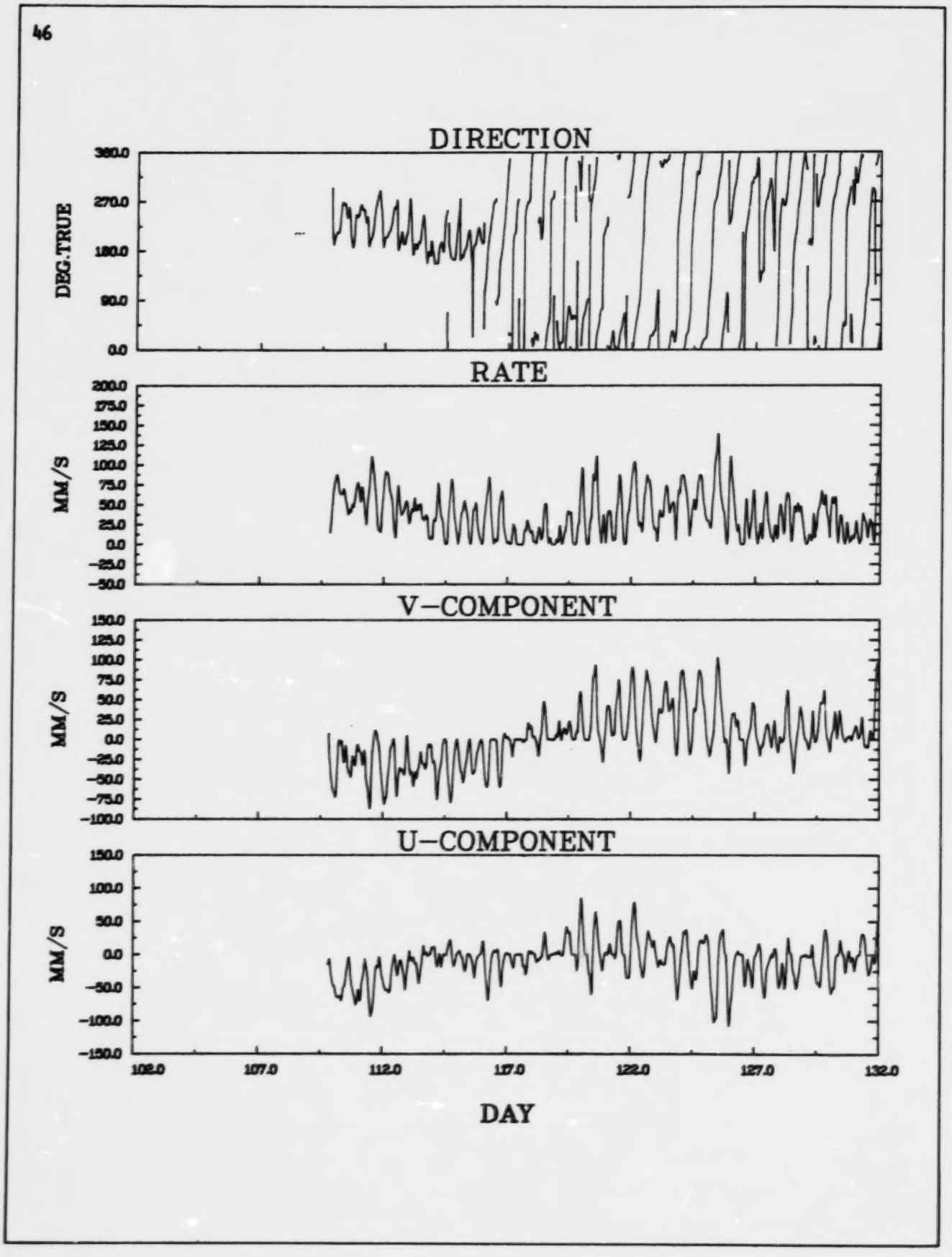
VELOCITIES RESOLVED ALONG 0. DEG. TRUE

CHAN	NAME	UNIT	NUMBER	MIN	MAX	MEAN	INTERCEPT	TREND(/SEC)	VARIANCE	STD. DEV.
1	U(15, 750M)	MM/S	3480	-.1403E+03	.1434E+03	.7107E+01	-18.581	.12299E-04	.15413E+04	.39260E+02
2	V(15, 750M)	MM/S	3480	-.9410E+02	.1537E+03	.2536E+02	-9.722	.16795E-04	.18669E+04	.43208E+02

R(15, 750M) VS D(15, 750M)

MM/S DEG.TRUE	SUB TOTAL	OUT OF RANGE	0.00 TO 50.00	50.00 TO 100.00	100.00 TO 150.00	150.00 TO 200.00
340.00 TO 360.00	401	*	5.2	5.4	1.0	
320.00 TO 340.00	208	*	3.4	2.1	.4	
300.00 TO 320.00	124	*	1.9	1.4	.2	
280.00 TO 300.00	129	*	2.6	1.0	.1	
260.00 TO 280.00	183	*	3.1	2.0	.1	
240.00 TO 260.00	112	*	2.1	1.0	.1	
220.00 TO 240.00	108	*	1.7	1.3	.1	
200.00 TO 220.00	138	*	2.1	1.7	.1	
180.00 TO 200.00	157	*	3.2	1.2		
160.00 TO 180.00	85	*	1.9	.6		
140.00 TO 160.00	54	*	1.5	.0		
120.00 TO 140.00	48	*	1.3	.1		
100.00 TO 120.00	64	*	1.6	.3		
80.00 TO 100.00	125	*	2.5	1.1		
60.00 TO 80.00	250	*	3.7	2.8	.7	
40.00 TO 60.00	413	*	4.2	4.7	2.5	.5
20.00 TO 40.00	436	*	4.6	4.9	2.6	.5
0.00 TO 20.00	450	*	5.2	5.2	2.4	.1
OUT OF RANGE	0	0				
SUB TOTAL	3480	0	1800	1284	360	36

STATION 15 750 m
18 APRIL - 6 JUNE 1972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180.0
90.0
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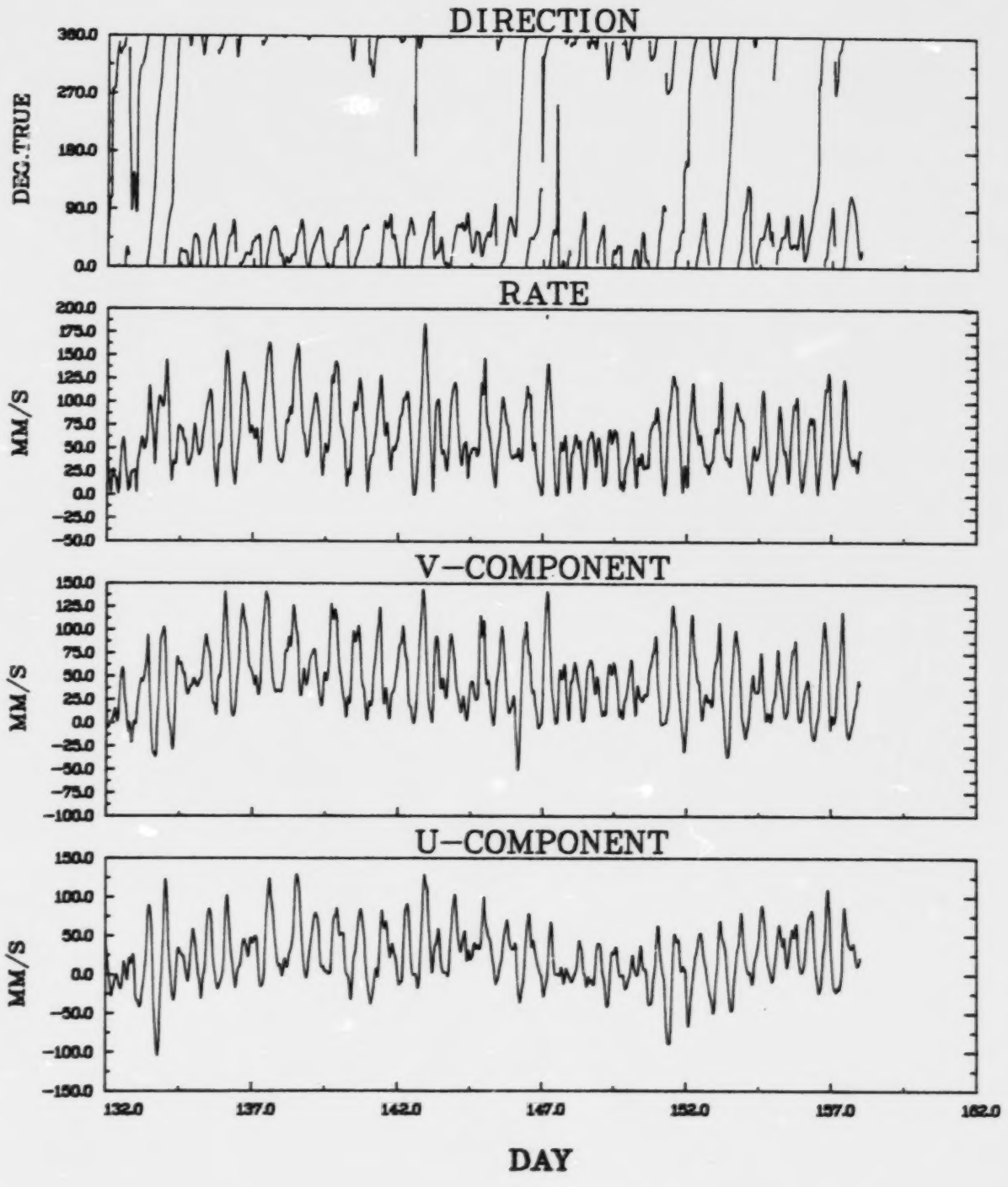
RATE
MM/S
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
-25.0
-50.0
V-COMPONENT
MM/S
150.0
125.0
100.0
75.0
50.0
25.0
0.0
-25.0
-50.0
-75.0
-100.0
U-COMPONENT
MM/S
150.0
100.0
50.0
0.0
-50.0
-100.0
-150.0
102.0
107.0
112.0
117.0
122.0
127.0
132.0
DAY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180.0
90.0
0.0
RATE
MM/S
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
-25.0
-50.0
V-COMPONENT
MM/S
150.0
125.0
100.0
75.0
50.0
25.0
0.0
-25.0
-50.0
-75.0
-100.0
U-COMPONENT
MM/S
150.0
100.0
50.0
0.0
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132.0
137.0
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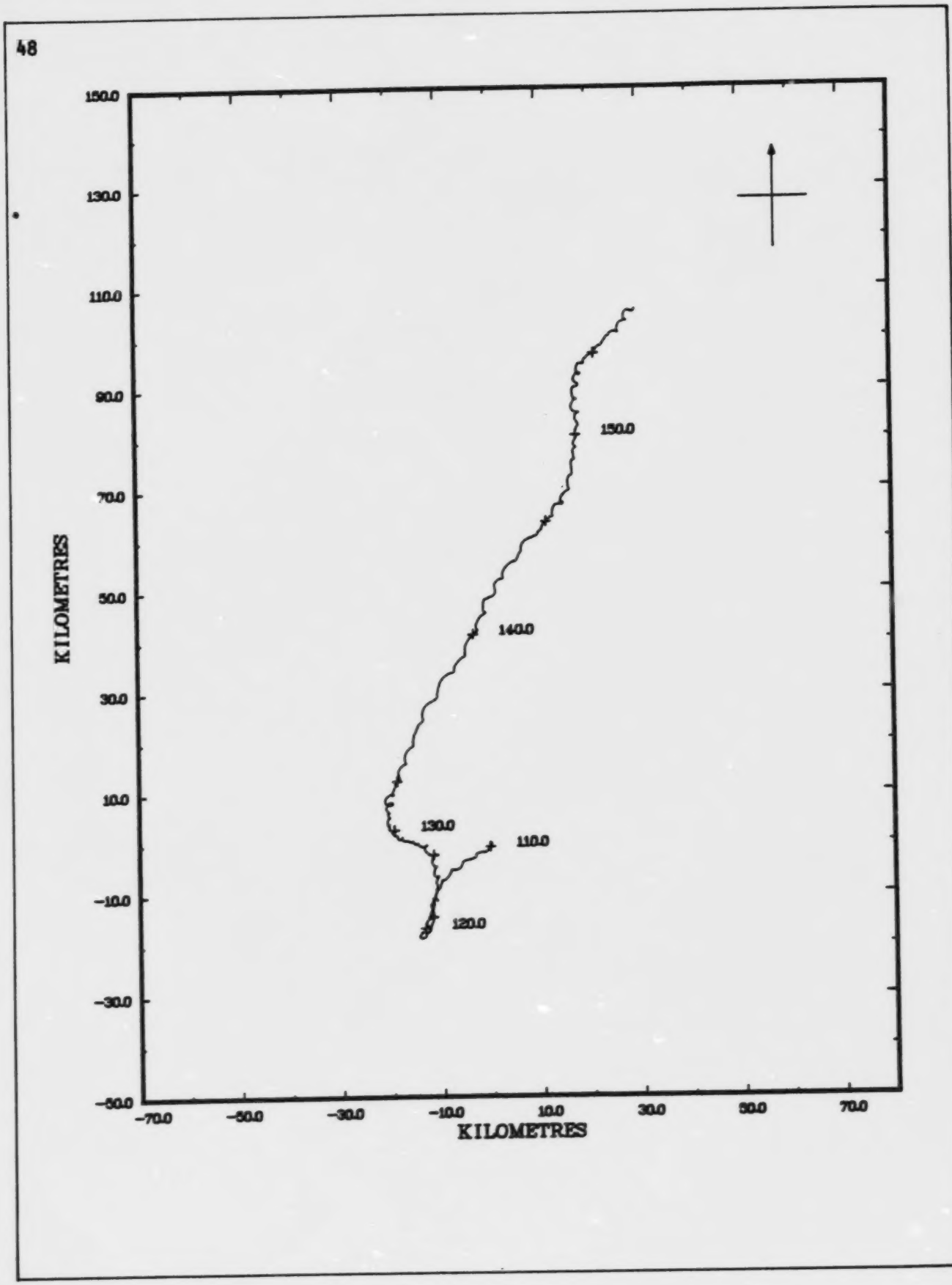
147.0
152.0
157.0
162.0
DAY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KILOMETRES
-70.0
-50.0
-30.0
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70.0
KILOMETRES
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130.0
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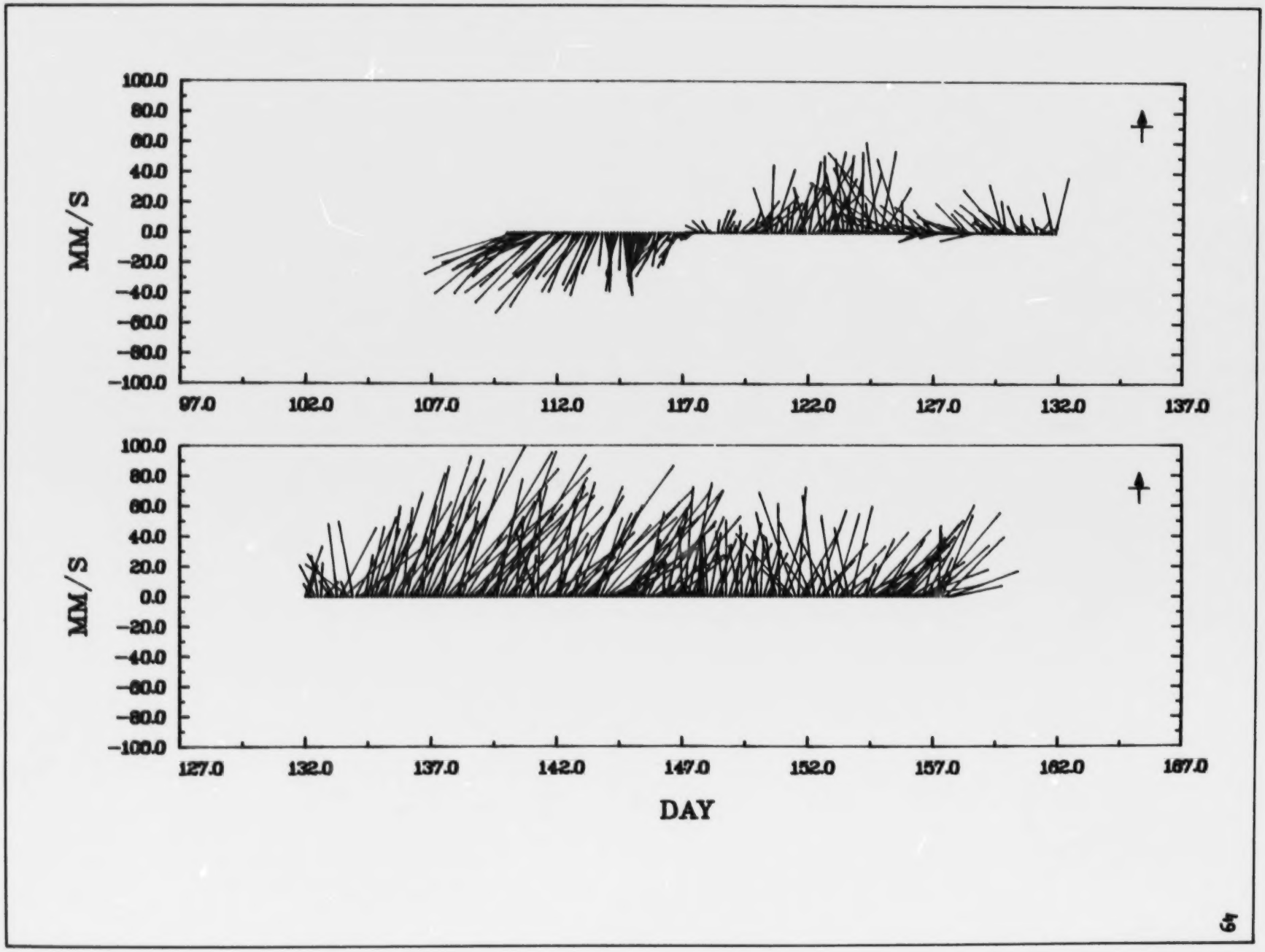
120.0


MM/S
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97.0
102.0
107.0
112.0
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122.0
127.0
132.0
137.0
MM/S
127.0
132.0
137.0
142.0
147.0
152.0
157.0
162.0
167.0
DAY

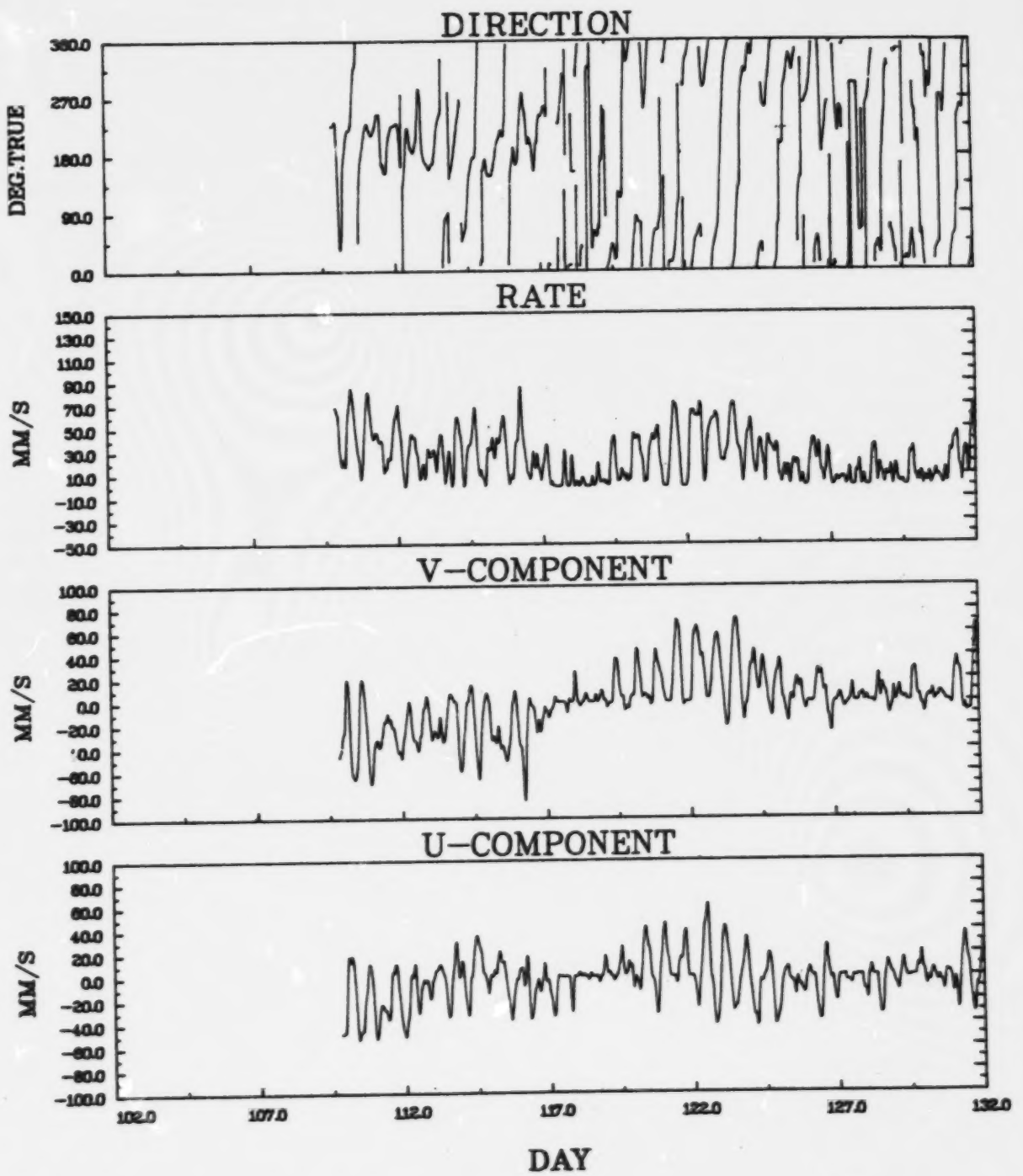
VELOCITIES RESOLVED ALONG 0. DEG. TRUE

CHAN	NAME	UNIT	NUMBER	MIN	MAX	MEAN	INTERCEPT	TREND(/SEC)	VARIANCE	STD. DEV.
1	U(15,1750M)	MM/S	2820	-.8133E+02	.8843E+02	.3423E+01	-9.448	.76041E-05	.22599E+03	.22935E+02
2	V(15,1750M)	MM/S	2820	-.1011E+03	.1126E+03	.1036E+02	-14.156	.14485E-04	.88051E+03	.29673E+02

R(15,1750M) VS D(15,1750M)

MM/S DEG.TRUE	SUB TOTAL	OUT OF RANGE	0.00 TO 50.00	50.00 TO 100.00	100.00 TO 150.00
340.00 TO 360.00	250	*	7.4	1.5	
320.00 TO 340.00	165	*	4.9	1.0	
300.00 TO 320.00	119	*	3.8	.5	
280.00 TO 300.00	124	*	4.1	.3	
260.00 TO 280.00	83	*	2.7	.2	
240.00 TO 260.00	122	*	4.3	.1	
220.00 TO 240.00	143	*	3.3	1.8	
200.00 TO 220.00	113	*	2.7	1.3	
180.00 TO 200.00	104	*	3.1	.6	
160.00 TO 180.00	111	*	3.3	.6	.0
140.00 TO 160.00	98	*	3.3	.1	
120.00 TO 140.00	50	*	1.8		
100.00 TO 120.00	58	*	2.0	.1	
80.00 TO 100.00	98	*	3.2	.3	
60.00 TO 80.00	177	*	4.8	1.5	
40.00 TO 60.00	294	*	6.6	3.6	.2
20.00 TO 40.00	318	*	7.6	3.4	.3
0.00 TO 20.00	393	*	9.2	4.4	.3
OUT OF RANGE	0	0			
SUB TOTAL	2820	0	2194	601	25

STATION 15 1750 m
18 APRIL - 27 MAY 1972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90.0
0.0
RATE
MM/S
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110.0
90.0
70.0
50.0
30.0
10.0
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-30.0
-50.0
V-COMPONENT
MM/S
100.0
80.0
60.0
40.0
20.0
0.0
-20.0
-40.0
-60.0
-80.0
-100.0
U-COMPONENT
MM/S
100.0
80.0
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20.0
0.0
-20.0
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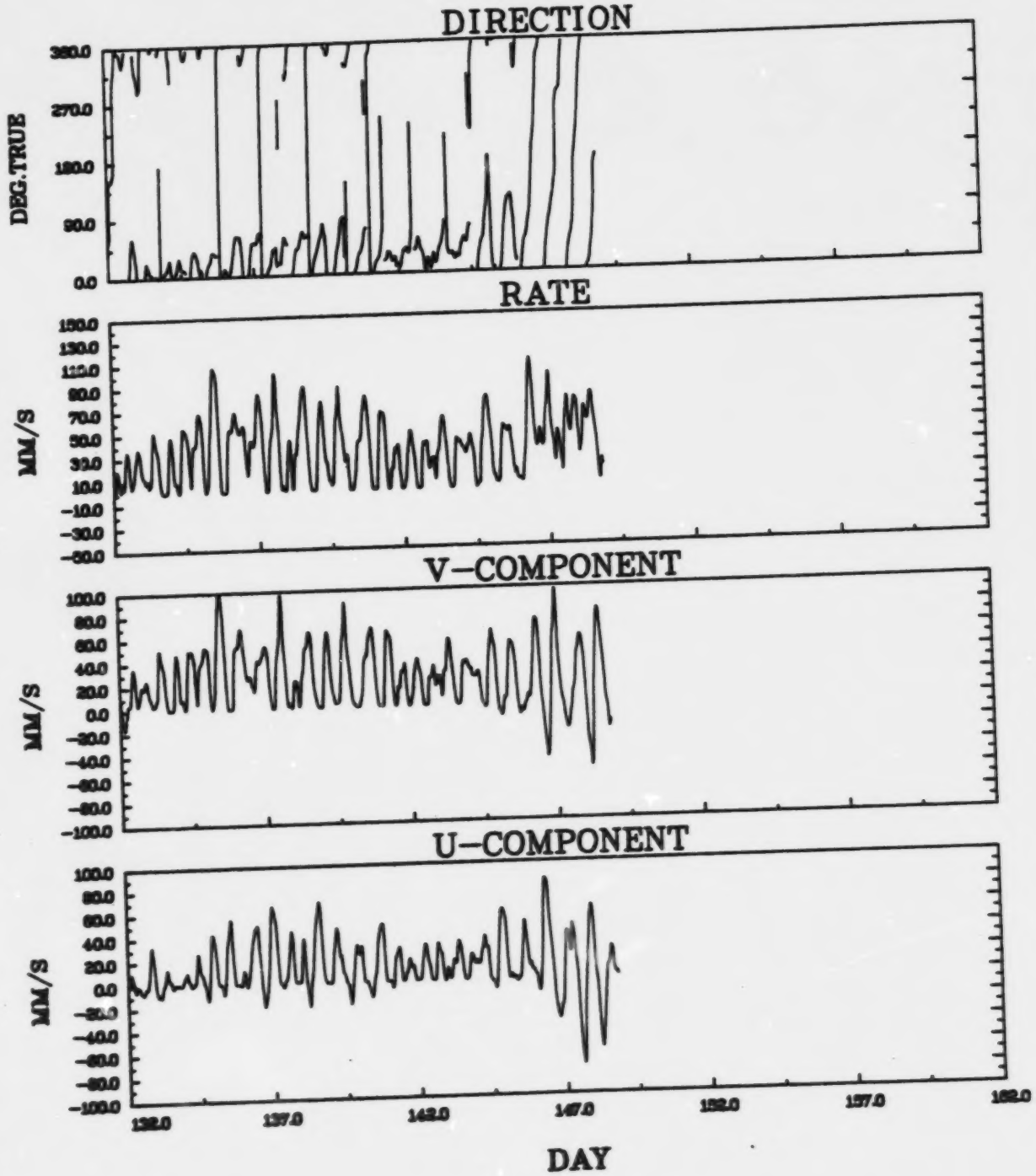
127.0
132.0
DAY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RATE
MM/S
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110.0
90.0
70.0
50.0
30.0
10.0
-10.0
-30.0
-50.0
V-COMPONENT
MM/S
100.0
80.0
60.0
40.0
20.0
0.0
-20.0
-40.0
-60.0
-80.0
-100.0
U-COMPONENT
MM/S
100.0
80.0
60.0
40.0
20.0
0.0
-20.0
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147.0
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157.0
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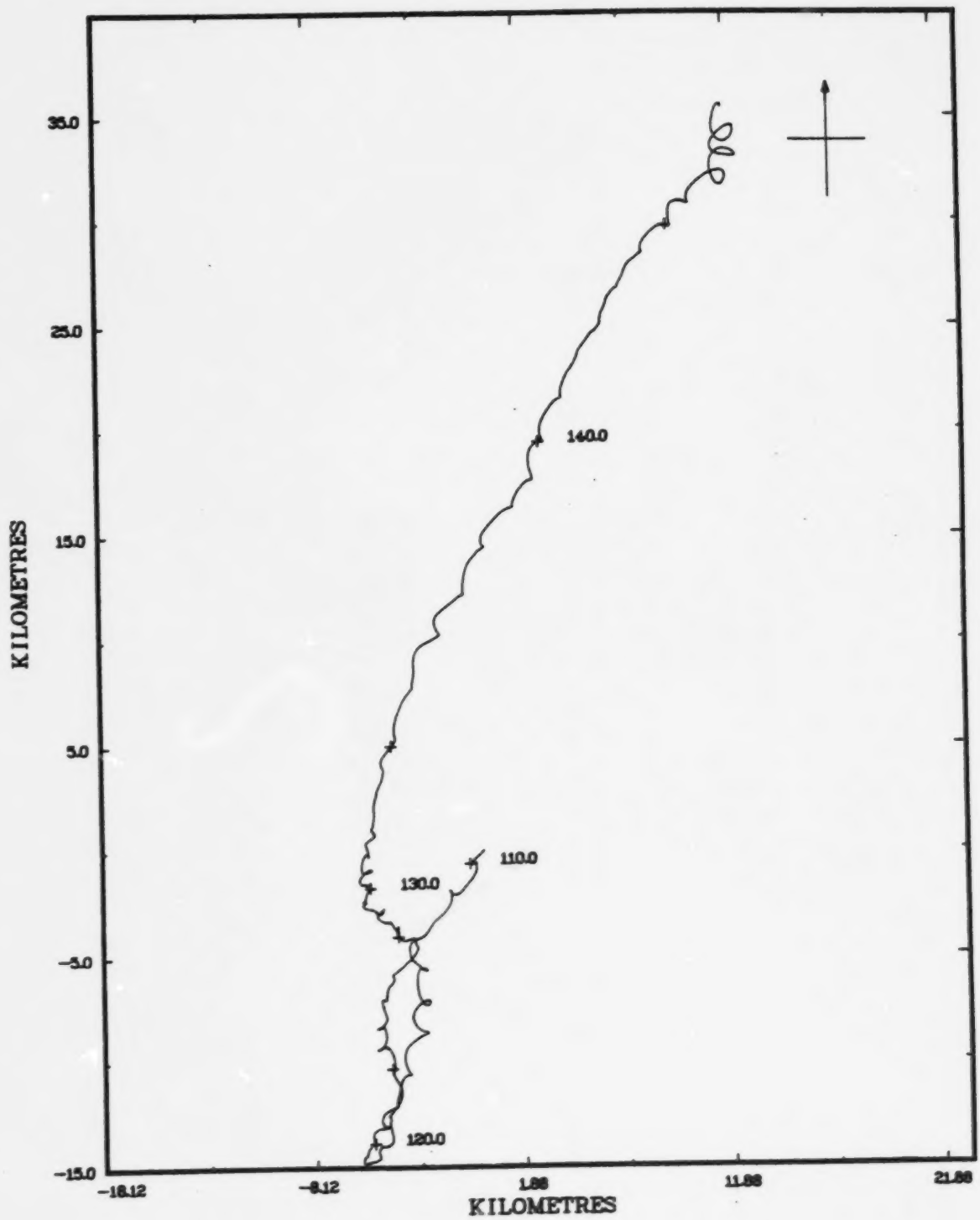
DAY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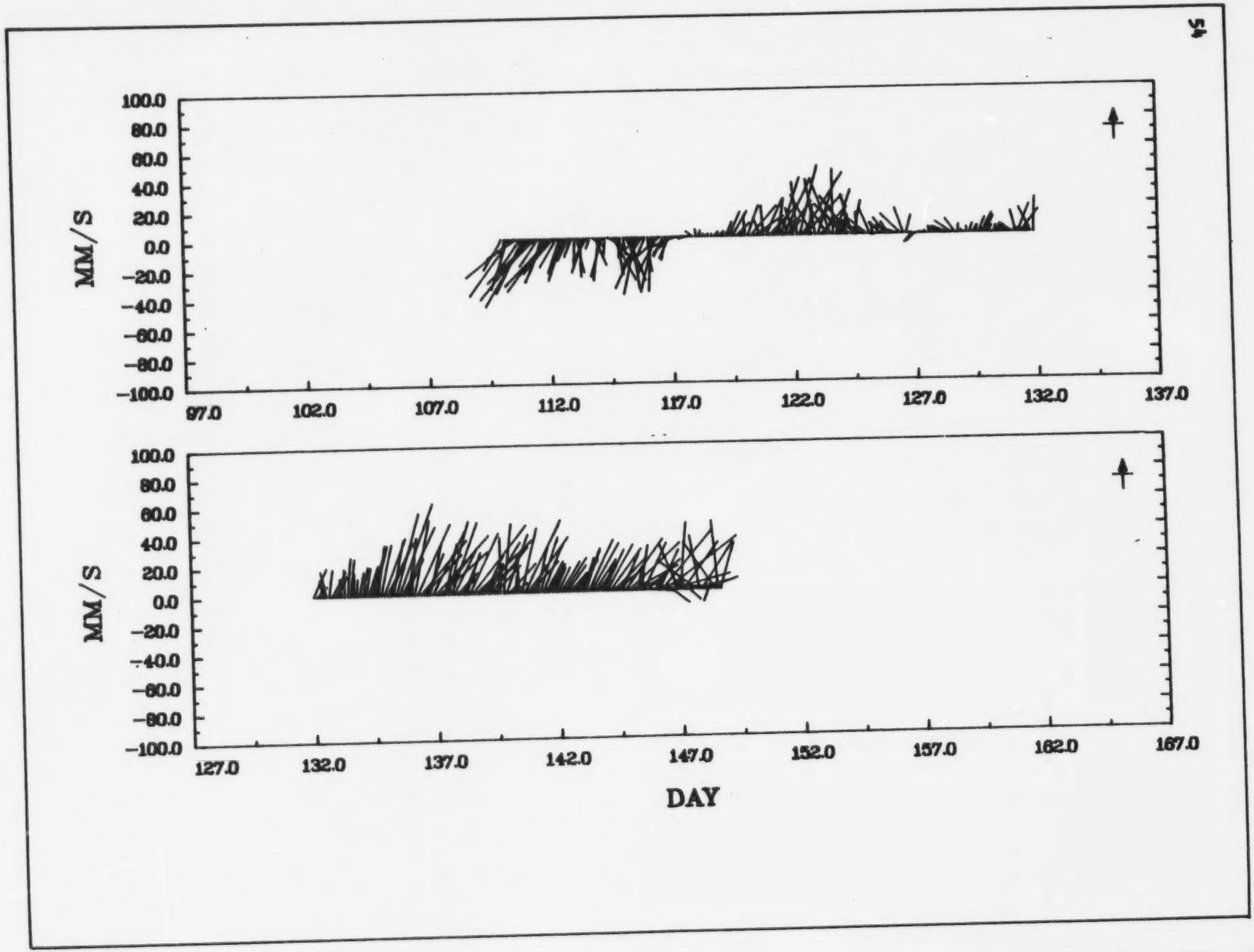
11.88
21.88
KILOMETRES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-80.0
-100.0
97.0
102.0
107.0
112.0
117.0
122.0
127.0
132.0
137.0
MM/S
100.0
80.0
60.0
40.0
20.0
0.0
-20.0
-40.0
-60.0
-80.0
-100.0
127.0
132.0
137.0
142.0
147.0
152.0
157.0
162.0
167.0
DAY

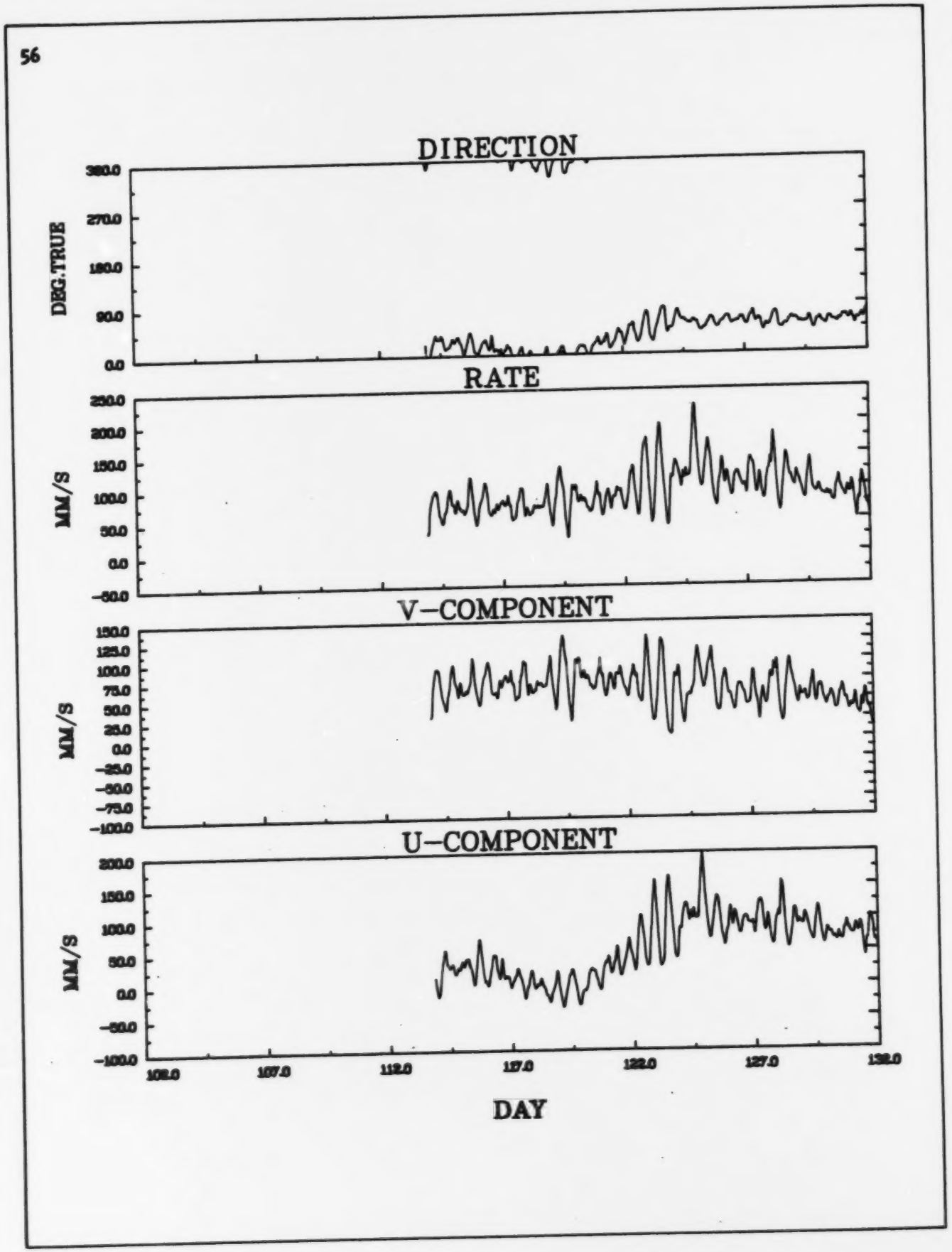
VELOCITIES RESOLVED ALONG 0. DEG. TRUE

CHAN	NAME	UNIT	NUMBER	MIN	MAX	MEAN	INTERCEPT	TREND(/SEC)	VARIANCE	STD. DEV.
1	U(17,2750M)	MM/S	3036	-.8732E+02	.2020E+03	.2620E+02	69.593	-.23814E-04	.25558E+04	.50555E+02
2	V(17,2750M)	MM/S	3036	-.8429E+02	.1389E+03	.2233E+02	96.273	-.40581E-04	.23720E+04	.48703E+02

R(17,2750M) VS D(17,2750M)

MM/S DEG.TRUE	SUB TOTAL	OUT OF RANGE	0.00 TO 50.00	50.00 TO 100.00	100.00 TO 150.00	150.00 TO 200.00	200.00 TO 250.00
340.00 TO 360.00	140	*	.4	3.6	.6		
320.00 TO 340.00	37	*	.6	.7			
300.00 TO 320.00	15	*	.5				
280.00 TO 300.00	19	*	.6				
260.00 TO 280.00	70	*	1.9	.4			
240.00 TO 260.00	140	*	2.7	1.9			
220.00 TO 240.00	311	*	4.7	5.4	.1		
200.00 TO 220.00	234	*	4.4	3.3			
180.00 TO 200.00	104	*	2.5	1.0			
160.00 TO 180.00	100	*	1.8	1.5			
140.00 TO 160.00	117	*	1.8	2.0			
120.00 TO 140.00	29	*	.8	.2			
100.00 TO 120.00	29	*	.9	.1			
80.00 TO 100.00	89	*	1.3	1.3	.3		
60.00 TO 80.00	478	*	1.9	8.7	4.3	.7	.2
40.00 TO 60.00	592	*	1.9	8.9	7.1	1.3	.2
20.00 TO 40.00	251	*	.8	5.8	1.4	.2	
0.00 TO 20.00	281	*	1.2	7.1	.9		
OUT OF RANGE	0	0					
SUB TOTAL	3036	0	934	1572	450	67	13

STATION 17 2750 m
22 APRIL-3 JUNE 1972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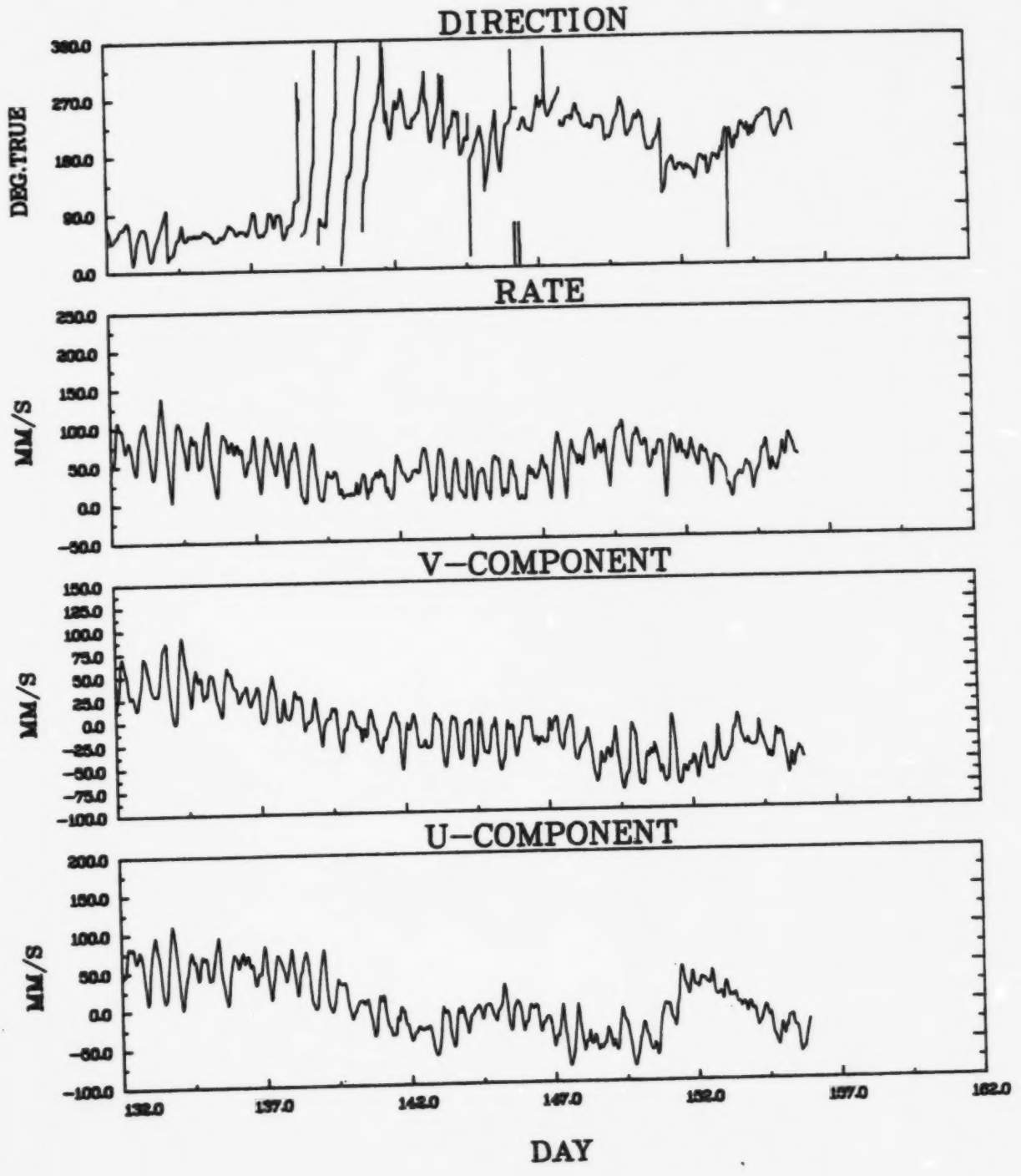
DEG.TRUE
360.0
270.0
180.0
90.0
0.0
RATE
MM/S
250.0
200.0
150.0
100.0
50.0
0.0
-50.0
V-COMPONENT
MM/S
150.0
125.0
100.0
75.0
50.0
25.0
0.0
-25.0
-50.0
-75.0
-100.0
U-COMPONENT
MM/S
200.0
150.0
100.0
50.0
0.0
-50.0
-100.0
102.0
107.0
112.0
117.0
122.0
127.0
132.0
DAY


DIRECTION
DEG.TRUE
360.0
270.0
180.0
90.0
0.0
RATE
MM/S
250.0
200.0
150.0
100.0
50.0
0.0
-50.0
V-COMPONENT
MM/S
150.0
125.0
100.0
75.0
50.0
25.0
0.0
-25.0
-50.0
-75.0
-100.0
U-COMPONENT
MM/S
200.0
150.0
100.0
50.0
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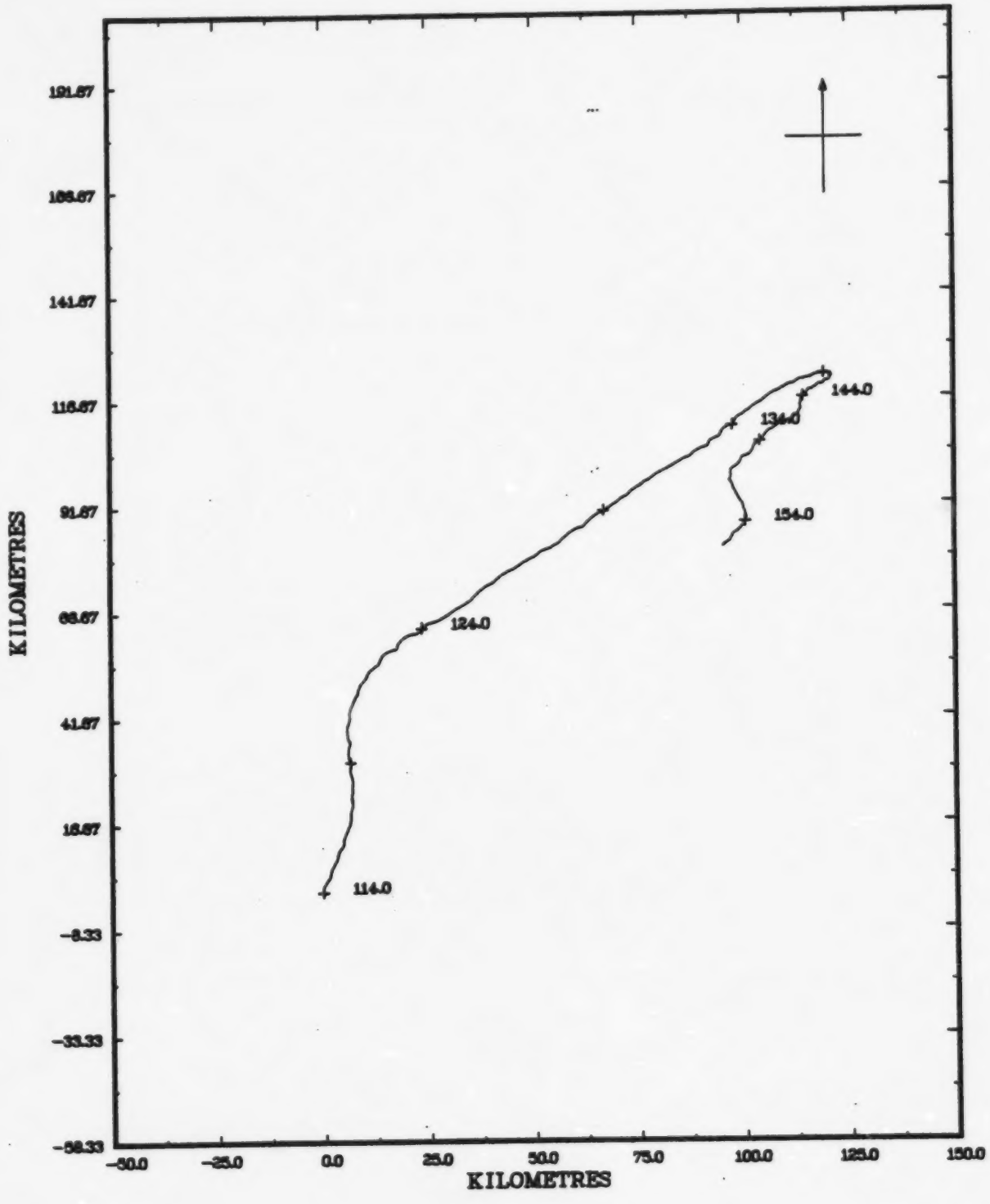
-100.0
132.0
137.0
142.0
147.0
152.0
157.0
162.0
DAY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-25.0
0.0
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50.0
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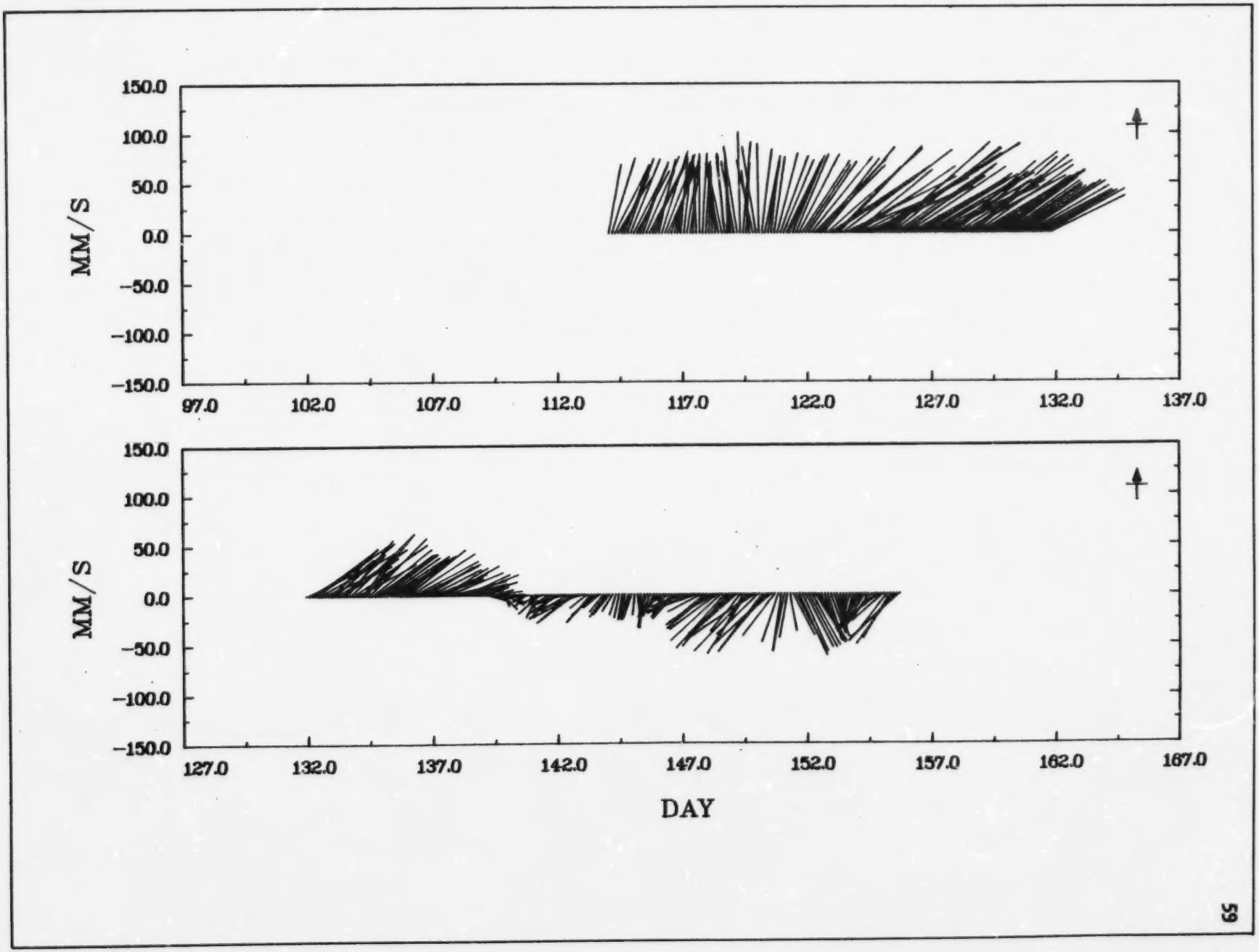
100.0
125.0
150.0
KILOMETRES
114.0
124.0
134.0
144.0
154.0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−50.0
−100.0
−150.0
MM/S
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102.0
107.0
112.0
117.0
122.0
127.0
132.0
137.0
150.0
100.0
50.0
0.0
−50.0
−100.0
−150.0
MM/S
127.0
132.0
137.0
142.0
147.0
152.0
157.0
162.0
167.0
DAY

VELOCITIES RESOLVED ALONG 0. DEG. TRUE

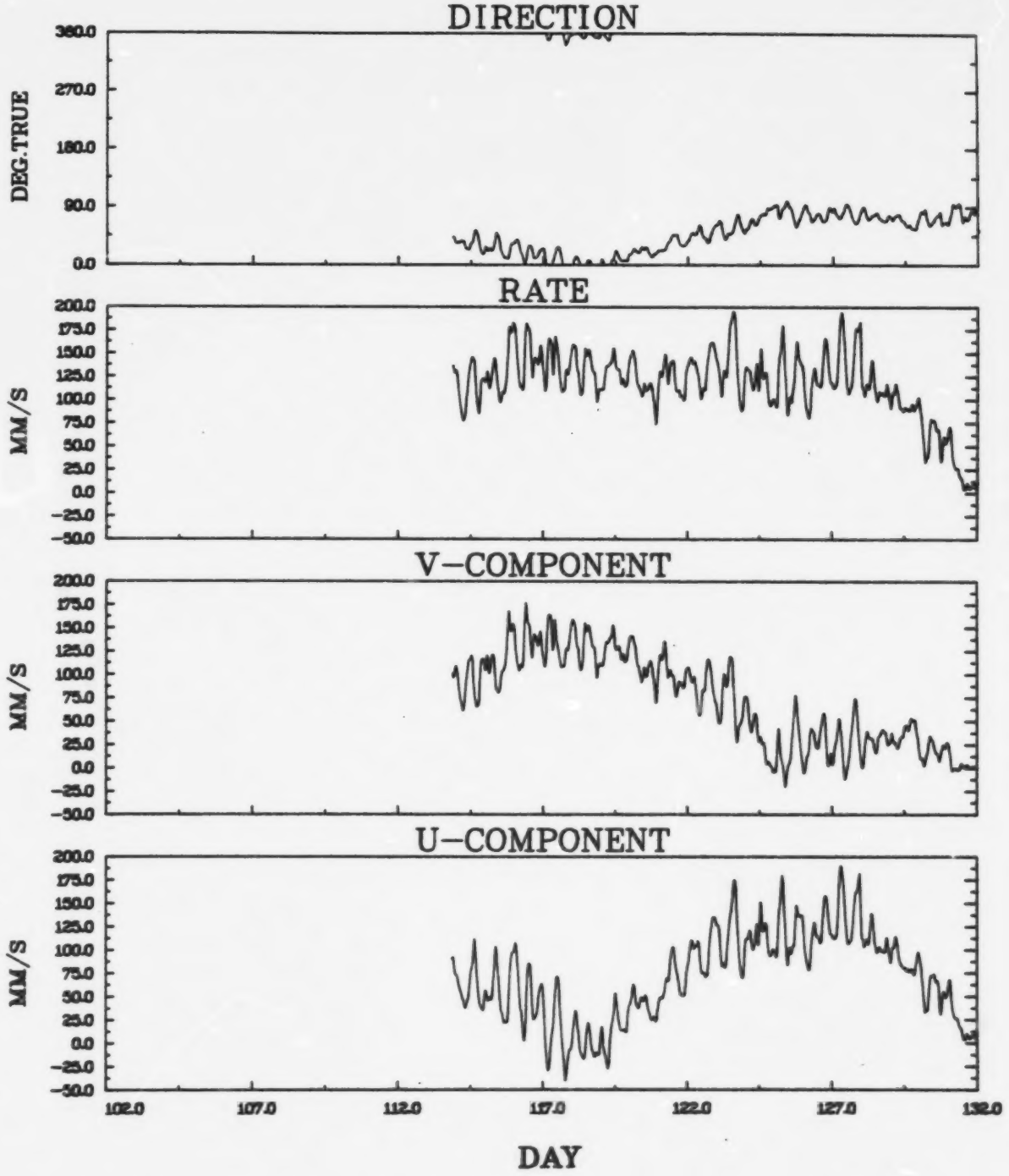
CHAN	NAME	UNIT	NUMBER	MIN	MAX	MEAN	INTERCEPT	TREND(/SEC)	VARIANCE	STD. DEV.
1	U(17,3500M)	MM/S	1980	-.4802E+02	.2022E+03	.4947E+02	80.914	-.26451E-04	.25569E+04	.50566E+02
2	V(17,3500M)	MM/S	1980	-.2581E+02	.1832E+03	.4811E+02	128.096	-.67290E-04	.28517E+04	.53401E+02

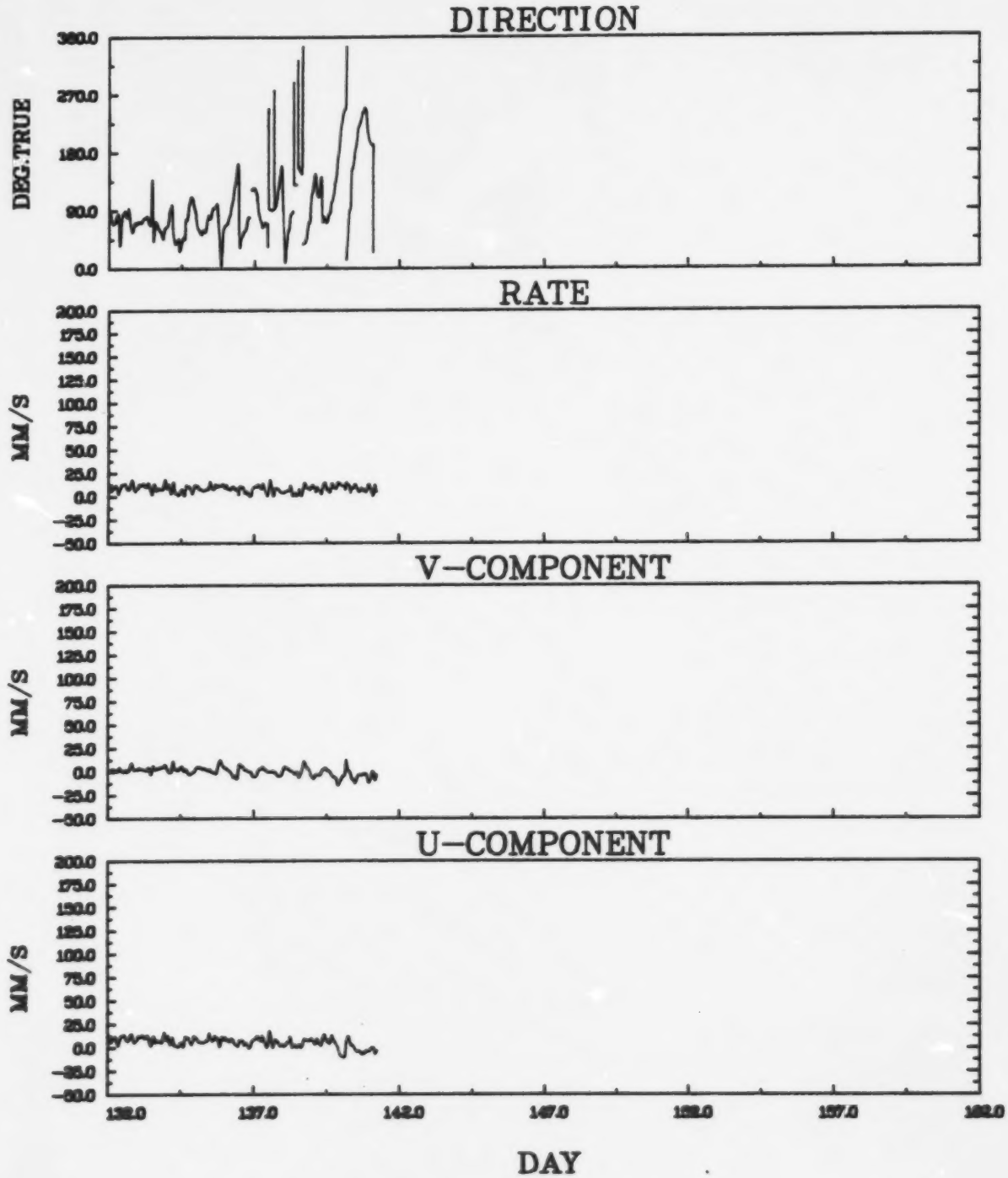
R(17,3500M) VS D(17,3500M)

MM/S DEG.TRUE		SUB TOTAL	OUT OF RANGE	0.00 TO 50.00	50.00 TO 100.00	100.00 TO 150.00	150.00 TO 200.00	200.00 TO 250.00
340.00 TO	360.00	107	*	.6	.3	3.6	.7	
320.00 TO	340.00	8	*	.3		.1		
300.00 TO	320.00	1	*	.1				
280.00 TO	300.00		*					
260.00 TO	280.00	1	*	.1				
240.00 TO	260.00	18	*	.9				
220.00 TO	240.00	23	*	1.2				
200.00 TO	220.00	21	*	1.1				
180.00 TO	200.00	17	*	.9				
160.00 TO	180.00	16	*	.8				
140.00 TO	160.00	30	*	1.5				
120.00 TO	140.00	41	*	2.1				
100.00 TO	120.00	70	*	3.4		.2		
80.00 TO	100.00	343	*	8.8	2.8	4.2	1.4	
60.00 TO	80.00	558	*	11.5	4.9	9.5	2.2	.1
40.00 TO	60.00	236	*	3.4	1.9	5.1	1.4	.1
20.00 TO	40.00	287	*	.9	1.6	9.8	2.2	
0.00 TO	20.00	208	*	.8	.5	7.4	1.8	
OUT OF RANGE		0	0					
SUB TOTAL		1980	0	755	240	788	193	4

STATION 17 3500 m

22 APRIL-20 MAY 1972


DIRECTION
DEG.TRUE
360.0
270.0
180.0
90.0
0.0
RATE
MM/S
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
-25.0
-50.0
V-COMPONENT
MM/S
U-COMPONENT
MM/S
102.0
107.0
112.0
117.0
122.0
127.0
132.0
DAY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180.0
90.0
0.0
RATE
MM/S
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150.0
125.0
100.0
75.0
50.0
25.0
0.0
-25.0
-50.0
V-COMPONENT
MM/S
U-COMPONENT
MM/S
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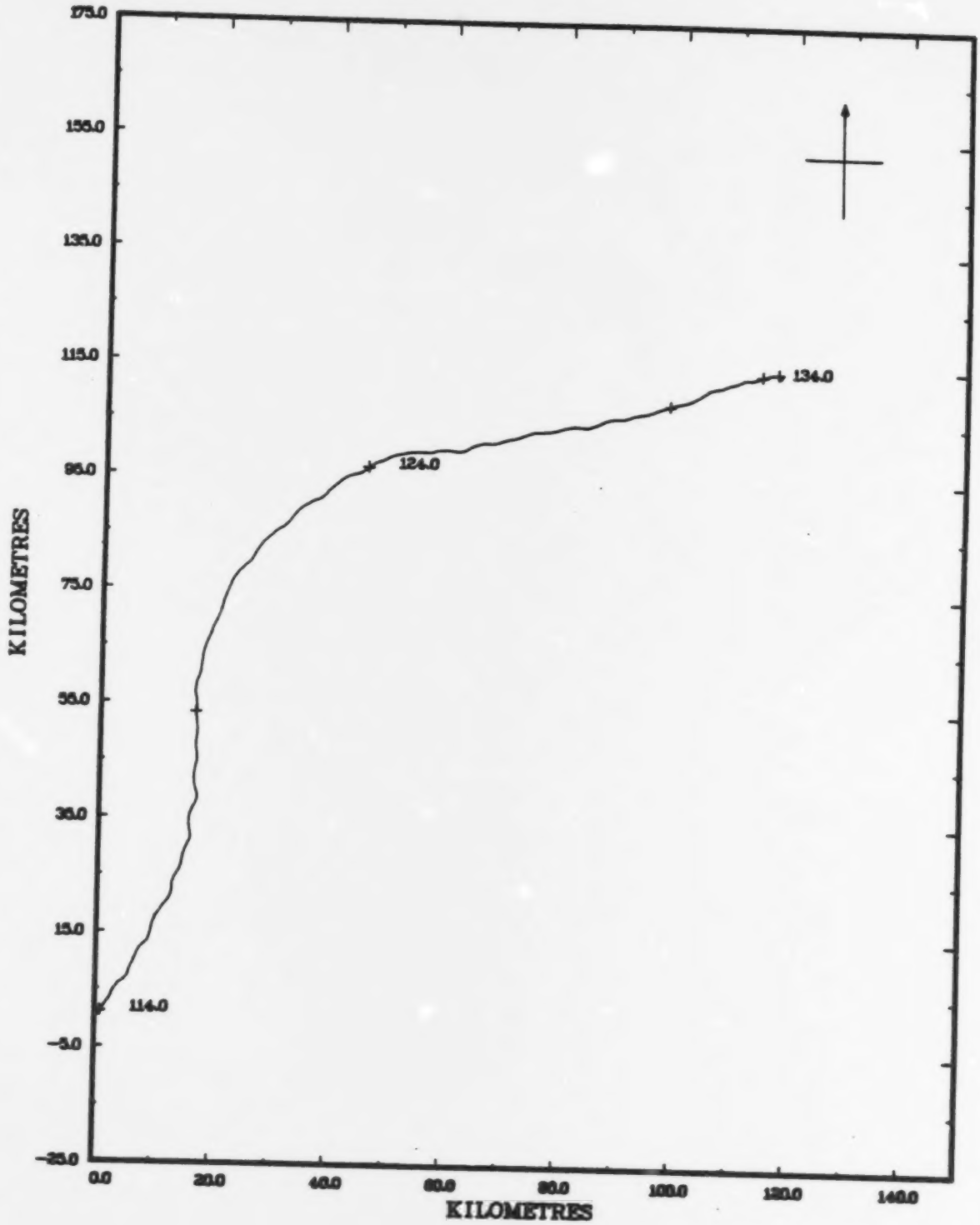
137.0
142.0
147.0
152.0
157.0
162.0
DAY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20.0
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KILOMETRES
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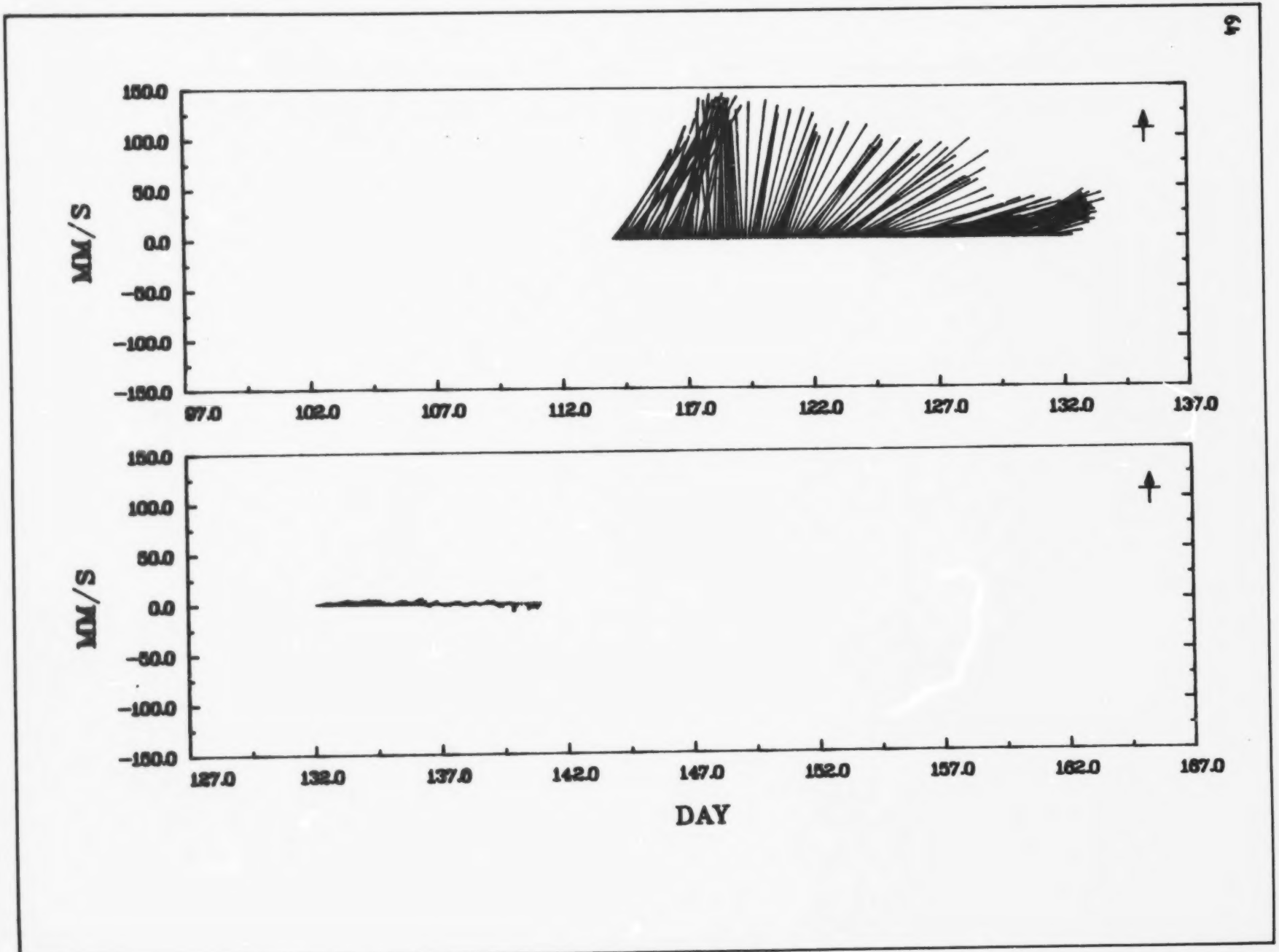
134.0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KM/S
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112.0
117.0
122.0
127.0
132.0
137.0
150.0
100.0
50.0
0.0
-50.0
-100.0
-150.0
KM/S
127.0
132.0
137.0
142.0
147.0
152.0
157.0
162.0
167.0
DAY

VELOCITIES RESOLVED ALONG 0. DEG. TRUE

CHAN	NAME	UNIT	NUMBER	MIN	MAX	MEAN	INTERCEPT	TREND(/SEC)	VARIANCE	STD. DEV.
1	U(18,2750M)	MM/S	2868	-.1144E+03	.2137E+03	.6077E+02	31.501	.17006E-04	.44638E+04	.66811E+02
2	V(18,2750M)	MM/S	2868	-.5193E+02	.1847E+03	.6576E+01	142.132	-.44365E-04	.25927E+04	.50919E+02

R(18,2750M) VS D(18,2750M)

MM/S DEG.TRUE		SUB TOTAL	OUT OF RANGE	0.00 TO 50.00	50.00 TO 100.00	100.00 TO 150.00	150.00 TO 200.00	200.00 TO 250.00
340.00 TO	360.00	325	*	.7	1.5	7.4	2.2	
320.00 TO	340.00	95	*	.1	1.3	1.4	.6	
300.00 TO	320.00	14	*	.1	.0	.3	.0	
280.00 TO	300.00	41	*	.9	1.0	.1		
260.00 TO	280.00	52	*	.9	.8	.1		
240.00 TO	260.00	20	*	.6	.1			
220.00 TO	240.00	26	*	.9	.0			
200.00 TO	220.00	17	*	.6				
180.00 TO	200.00	20	*	.7				
160.00 TO	180.00	15	*	.5				
140.00 TO	160.00	28	*	.9	.1			
120.00 TO	140.00	50	*	1.3	.5			
100.00 TO	120.00	98	*	1.1	1.8	.5		
80.00 TO	100.00	301	*	.9	3.6	3.6	2.0	.3
60.00 TO	80.00	560	*	.9	3.2	7.5	5.7	2.2
40.00 TO	60.00	513	*	.8	3.3	8.9	4.6	.2
20.00 TO	40.00	475	*	.6	3.7	9.6	2.9	
0.00 TO	20.00	198	*	.7	2.5	3.1	.6	
OUT OF RANGE		0	0					
SUB TOTAL		2868	0	354	678	1220	535	81

STATION 18 2750 m

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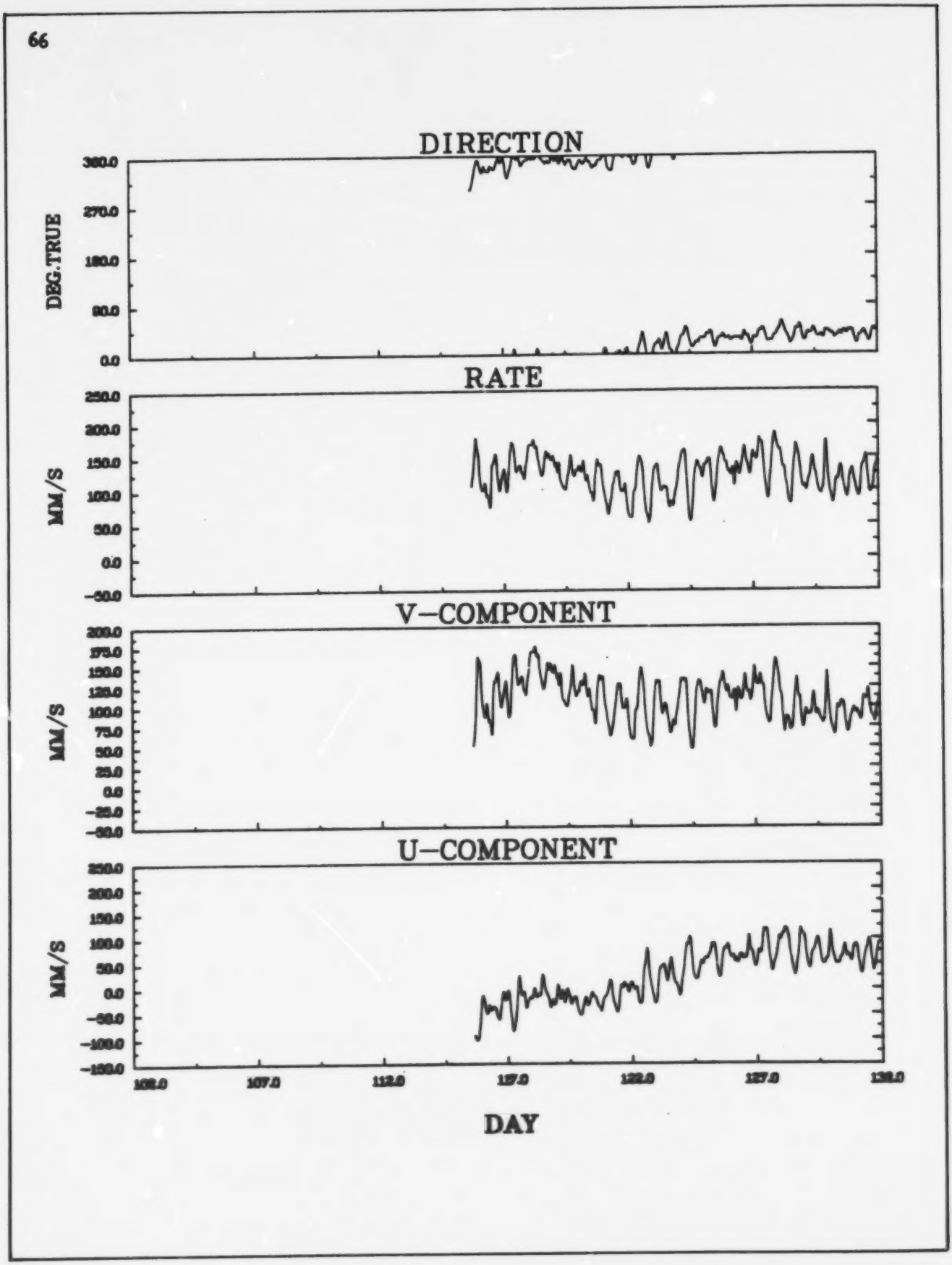
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DEG.TRUE
360.0
270.0
180.0
90.0
0.0
RATE
MM/S
250.0
200.0
150.0
100.0
50.0
0.0
-50.0
V-COMPONENT
MM/S
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
-25.0
-50.0
U-COMPONENT
MM/S
250.0
200.0
150.0
100.0
50.0
0.0
-50.0
-100.0
-150.0
102.0
107.0
112.0
117.0
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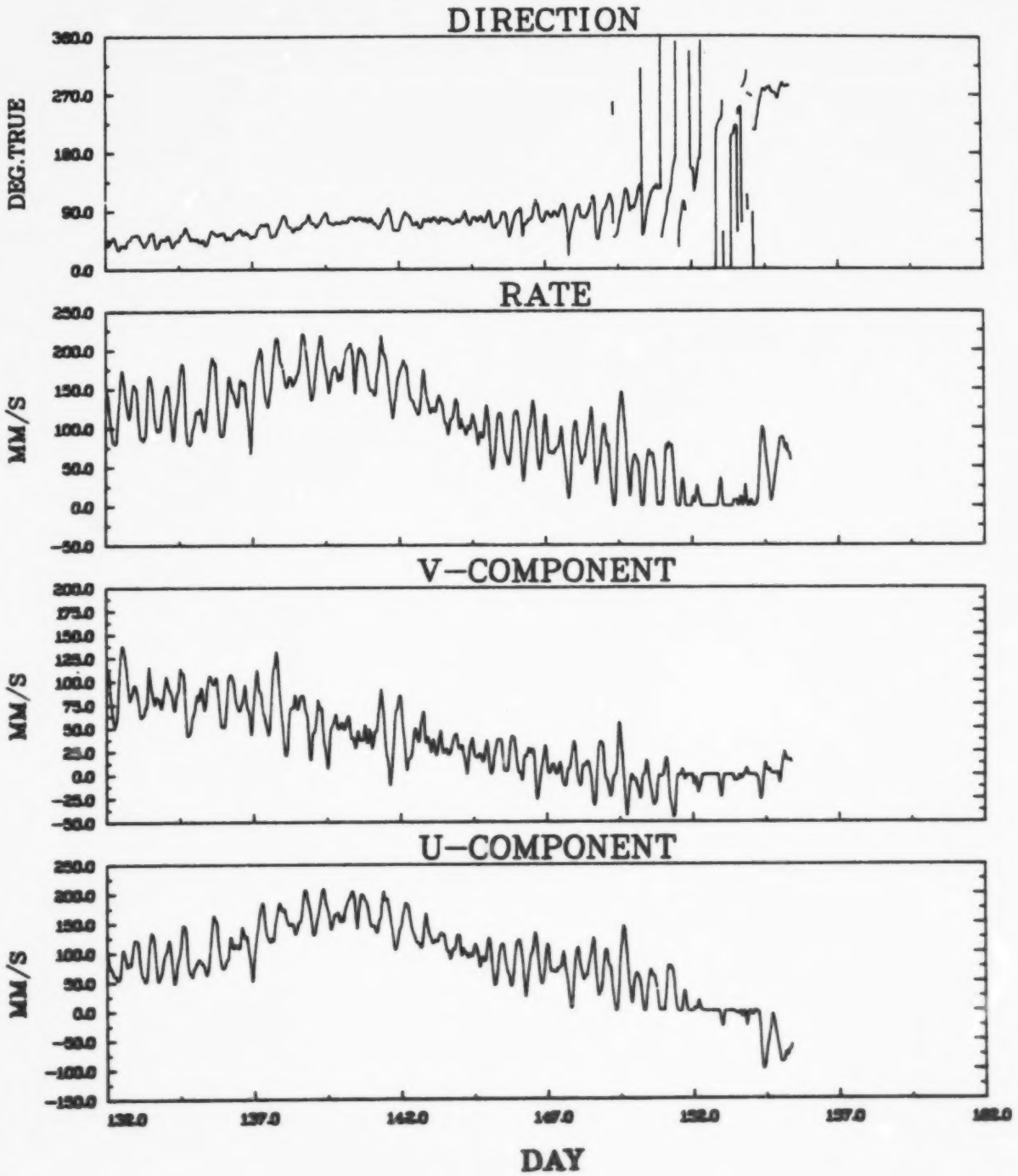
DAY


DIRECTION
DEG.TRUE
360.0
270.0
180.0
90.0
0.0
RATE
MM/S
250.0
200.0
150.0
100.0
50.0
0.0
-50.0
V-COMPONENT
MM/S
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
-25.0
-50.0
U-COMPONENT
MM/S
250.0
200.0
150.0
100.0
50.0
0.0
-50.0
-100.0
-150.0
132.0
137.0
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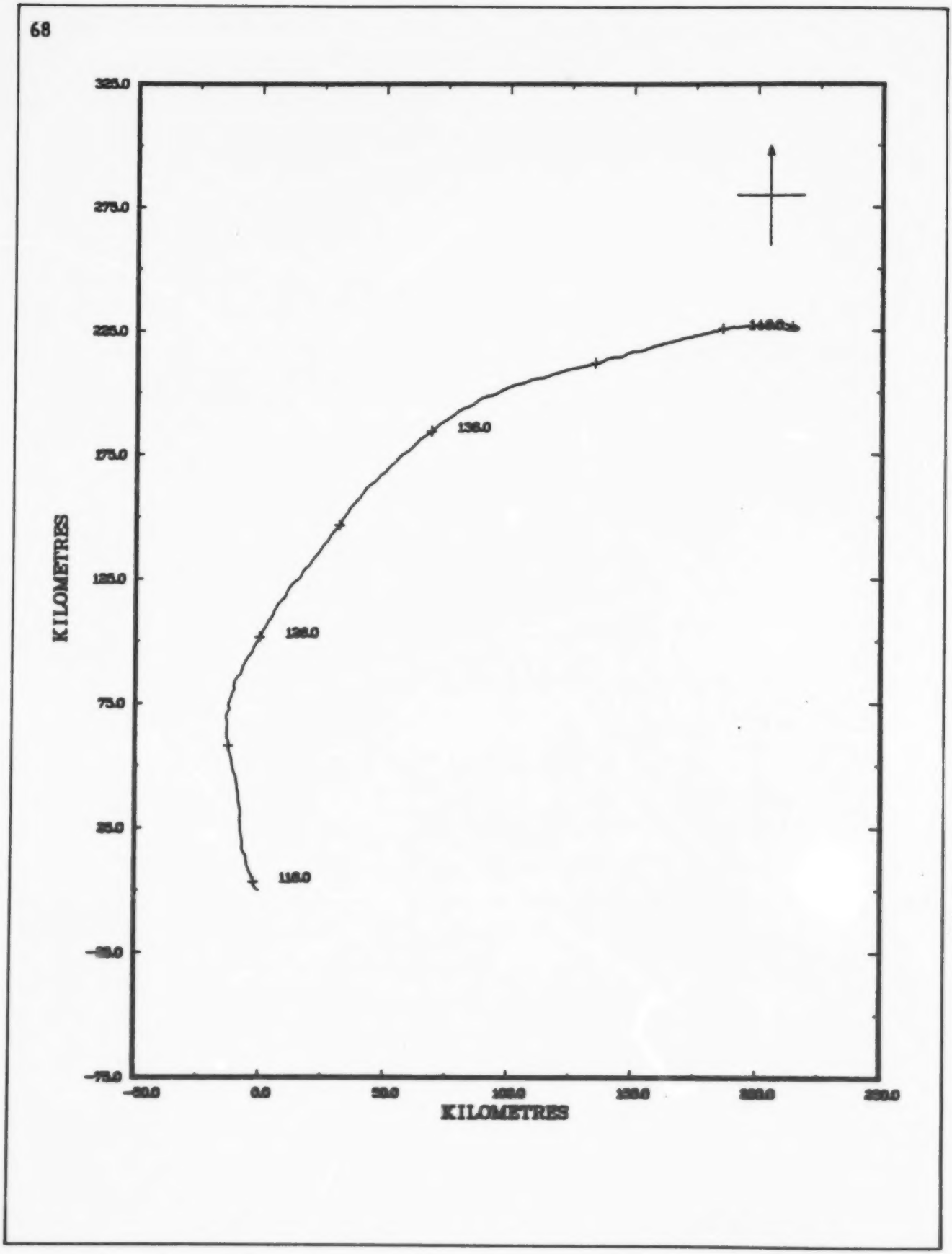
DAY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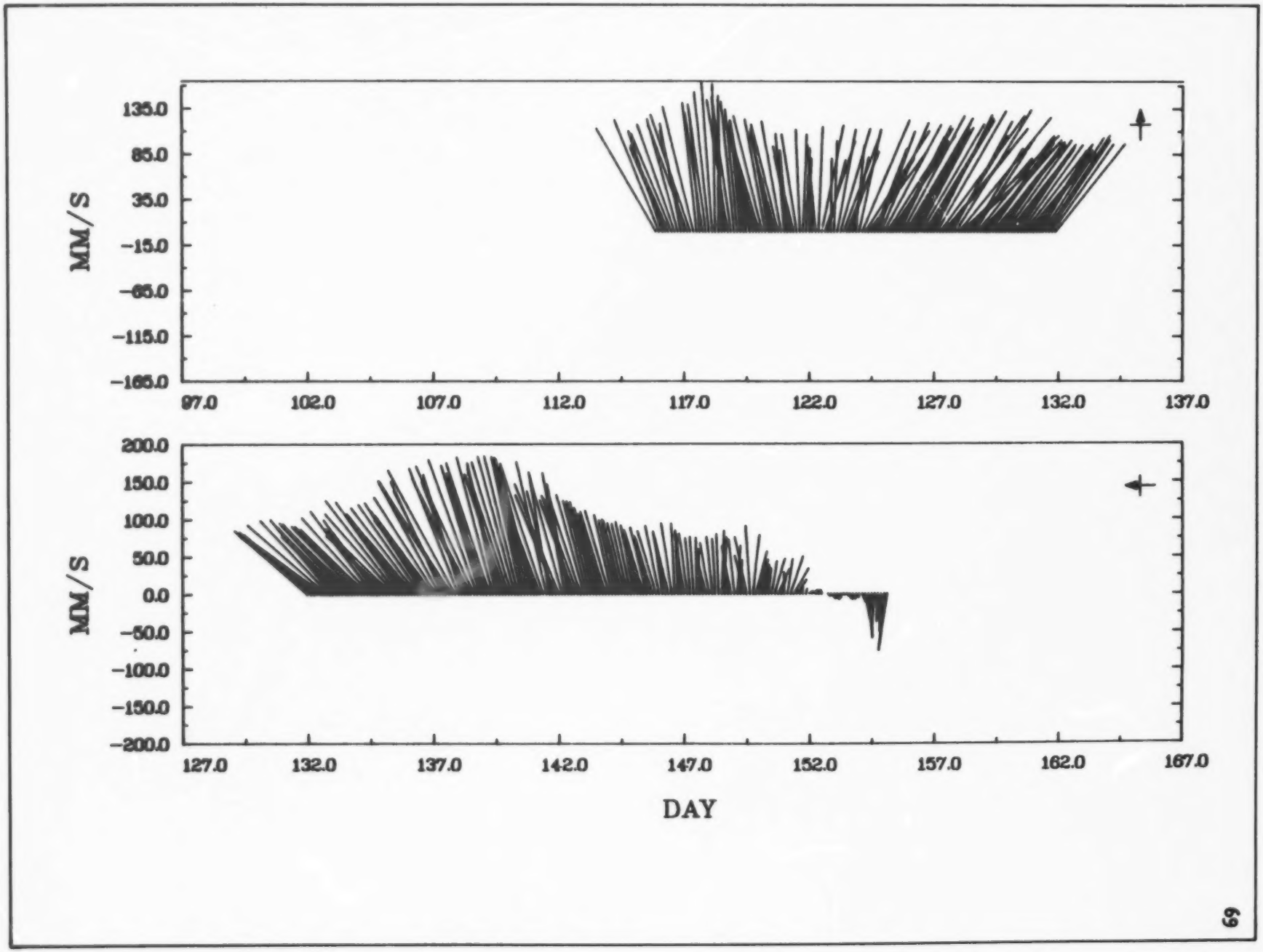
KILOMETRES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117.0
122.0
127.0
132.0
137.0
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-100.0
-150.0
-200.0
MM/S
127.0
132.0
137.0
142.0
147.0
152.0
157.0
162.0
167.0
DAY

VELOCITIES RESOLVED ALONG 0. DEG. TRUE

CHAN	NAME	UNIT	NUMBER	MIN	MAX	MEAN	INTERCEPT	TREND(/SEC)	VARIANCE	STD. DEV.
1	UATE	MM/S	2644	-.6086E+02	.2795E+03	.1029E+03	17.573	-.53765E-06	.50796E+04	.71272E+02
2	VE 18;3500M)	MM/S	2644	-.6700E+02	.1986E+03	.6029E+02	147.676	-.41916E-04	.29935E+04	.54713E+02

RATE VS DE 18;3500M)

MM/S DEG.TRUE		SUR TOTAL	OUT OF RANGE	0.00 TO 50.00	50.00 TO 100.00	100.00 TO 150.00	150.00 TO 200.00	200.00 TO 250.00	250.00 TO 300.00
340.00 TO	360.00	231	*		2.8	5.4	.6		
320.00 TO	340.00	38	*		.4	1.1			
300.00 TO	320.00	15	*	.0	.5				
280.00 TO	300.00		*						
260.00 TO	280.00		*						
240.00 TO	260.00		*						
220.00 TO	240.00		*						
200.00 TO	220.00		*						
180.00 TO	200.00		*						
160.00 TO	180.00		*						
140.00 TO	160.00		*						
120.00 TO	140.00	30	*	.2	.5	.4			
100.00 TO	120.00	252	*	.3	2.4	6.0	.8		
80.00 TO	100.00	581	*	.7	.9	5.6	9.3	5.0	1.1
60.00 TO	80.00	429	*		.3	5.6	7.0	3.2	.0
40.00 TO	60.00	547	*		1.7	10.8	6.7	1.4	
20.00 TO	40.00	296	*		3.1	5.3	2.1	.8	
0.00 TO	20.00	275	*		2.8	5.3	.4		
OUT OF RANGE		0	0						
SUR TOTAL		2644	0	20	408	1204	710	273	99

STATION 18 3500 m

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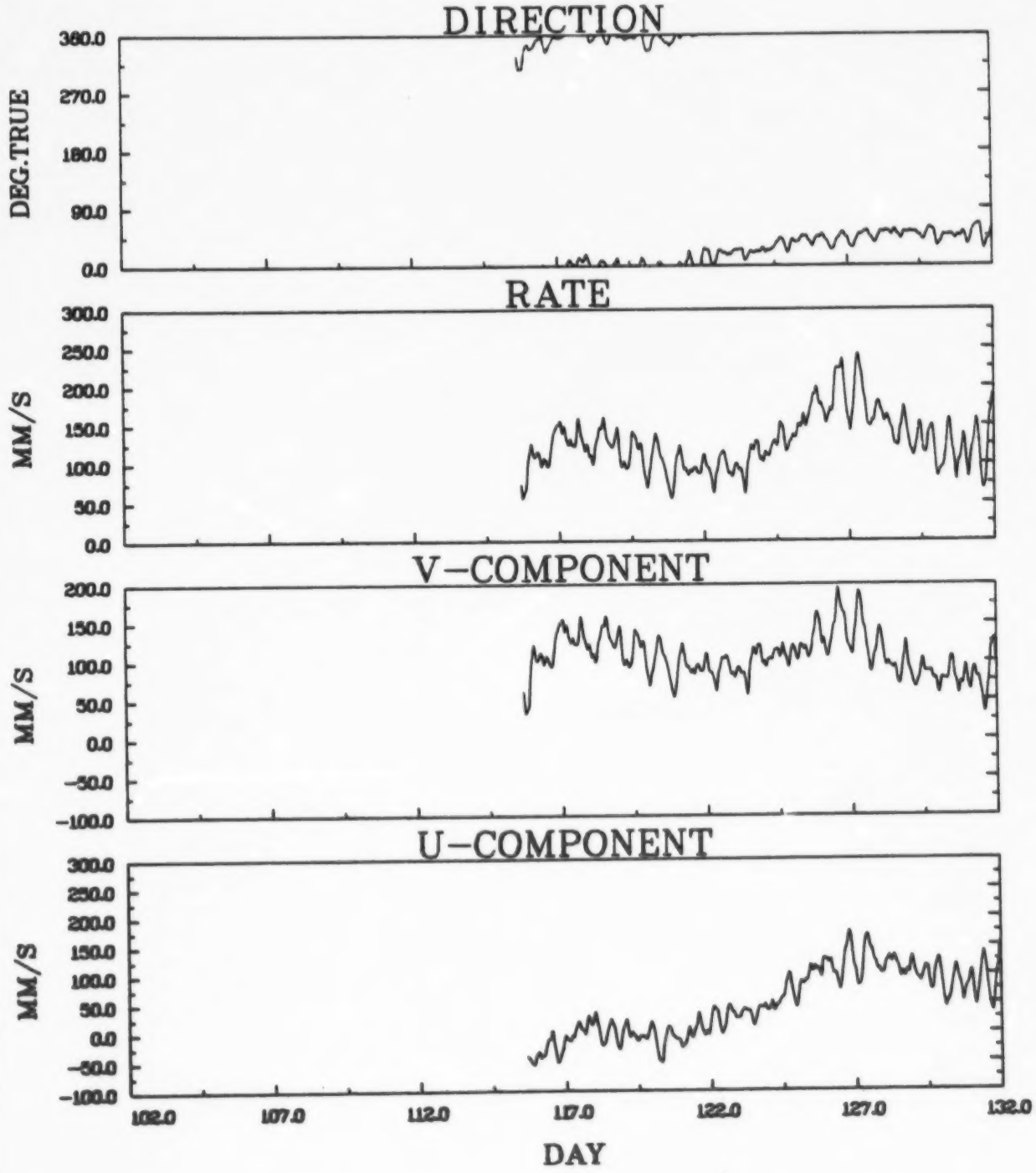
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RATE
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100.0
50.0
0.0
V-COMPONENT
MM/S
200.0
150.0
100.0
50.0
0.0
-50.0
-100.0
U-COMPONENT
MM/S
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200.0
150.0
100.0
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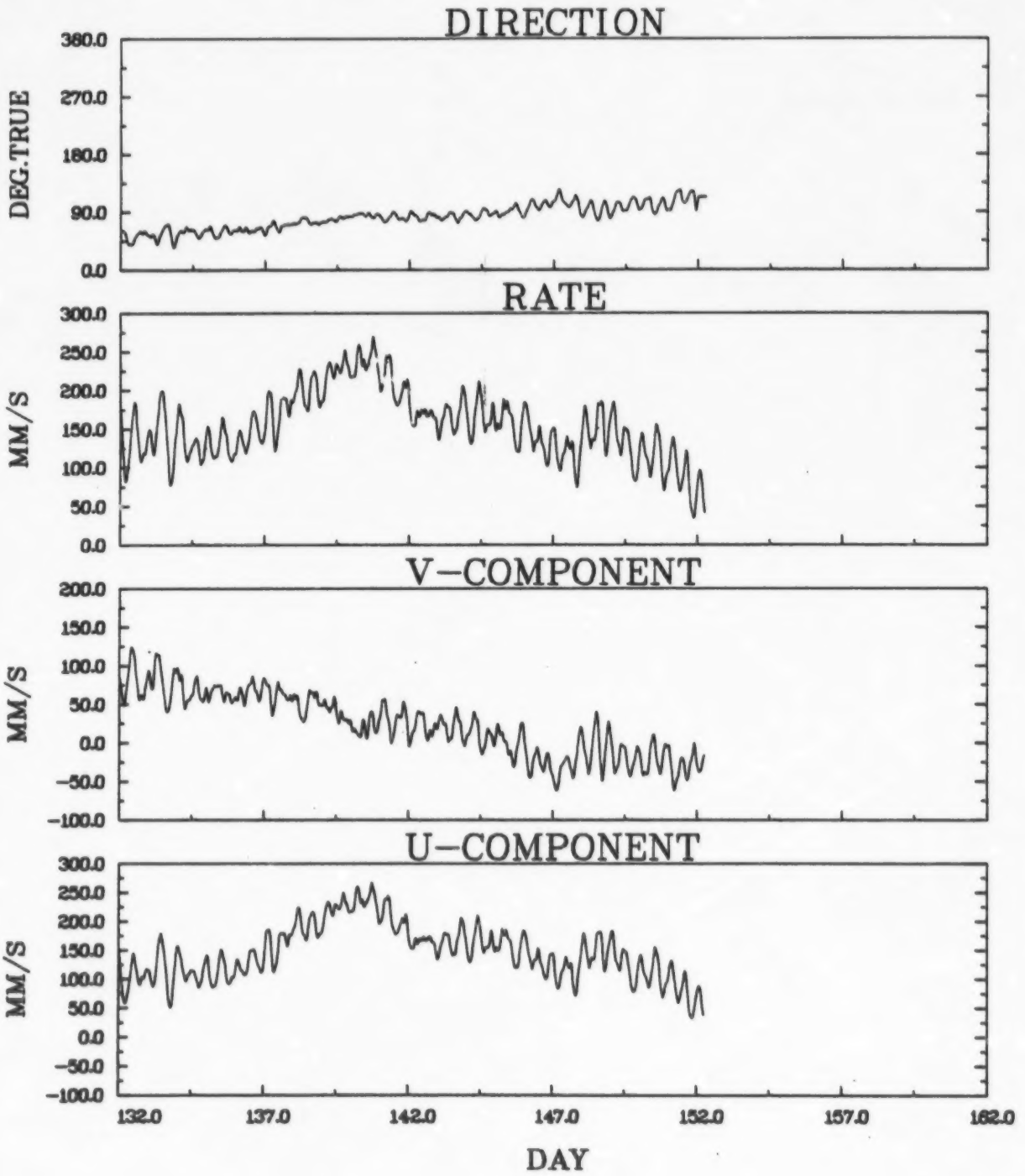
DAY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0.0
RATE
MM/S
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100.0
50.0
0.0
V–COMPONENT
MM/S
200.0
150.0
100.0
50.0
0.0
–50.0
–100.0
U–COMPONENT
MM/S
300.0
250.0
200.0
150.0
100.0
50.0
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–50.0
–100.0
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147.0
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157.0
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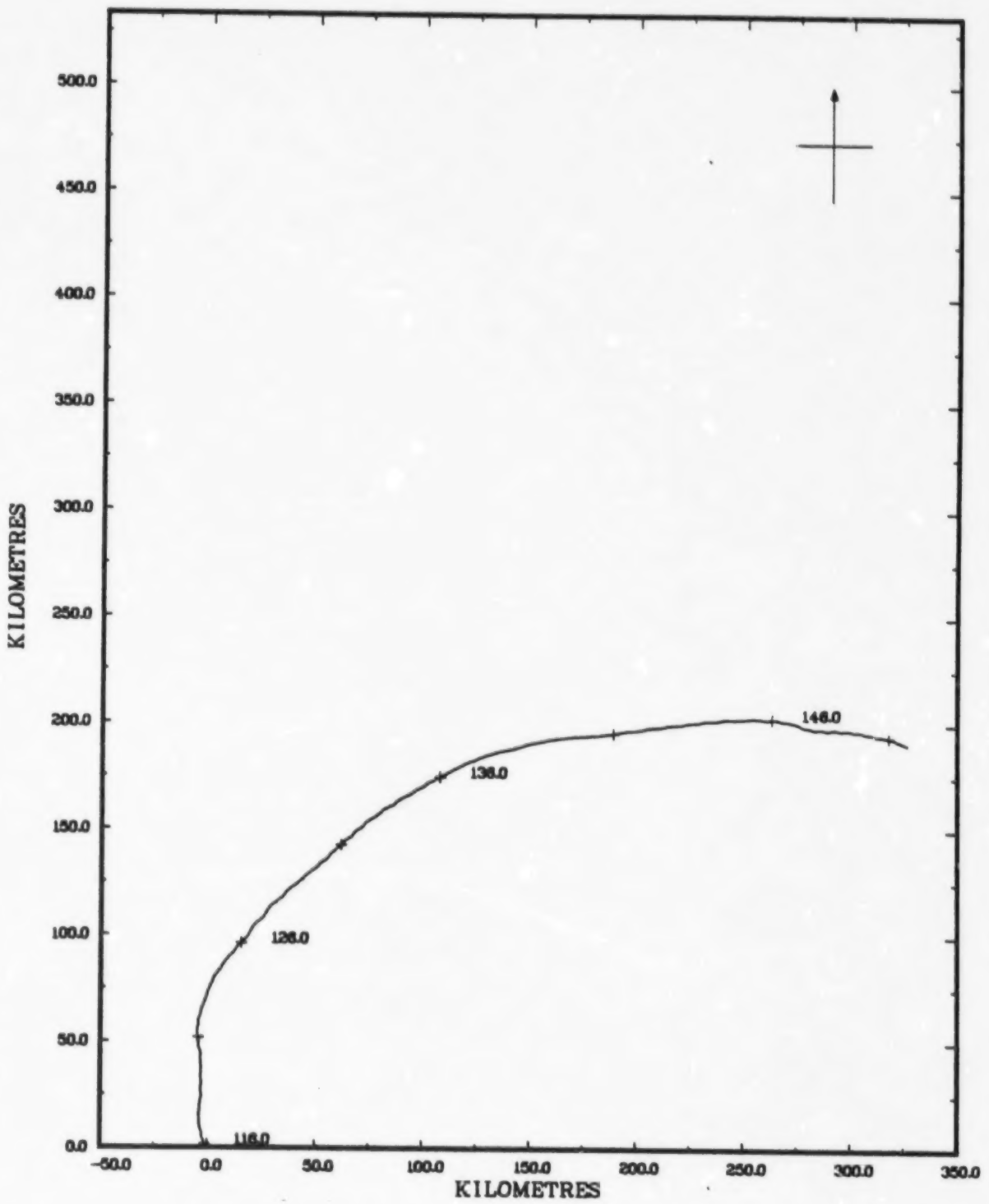
DAY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300.0
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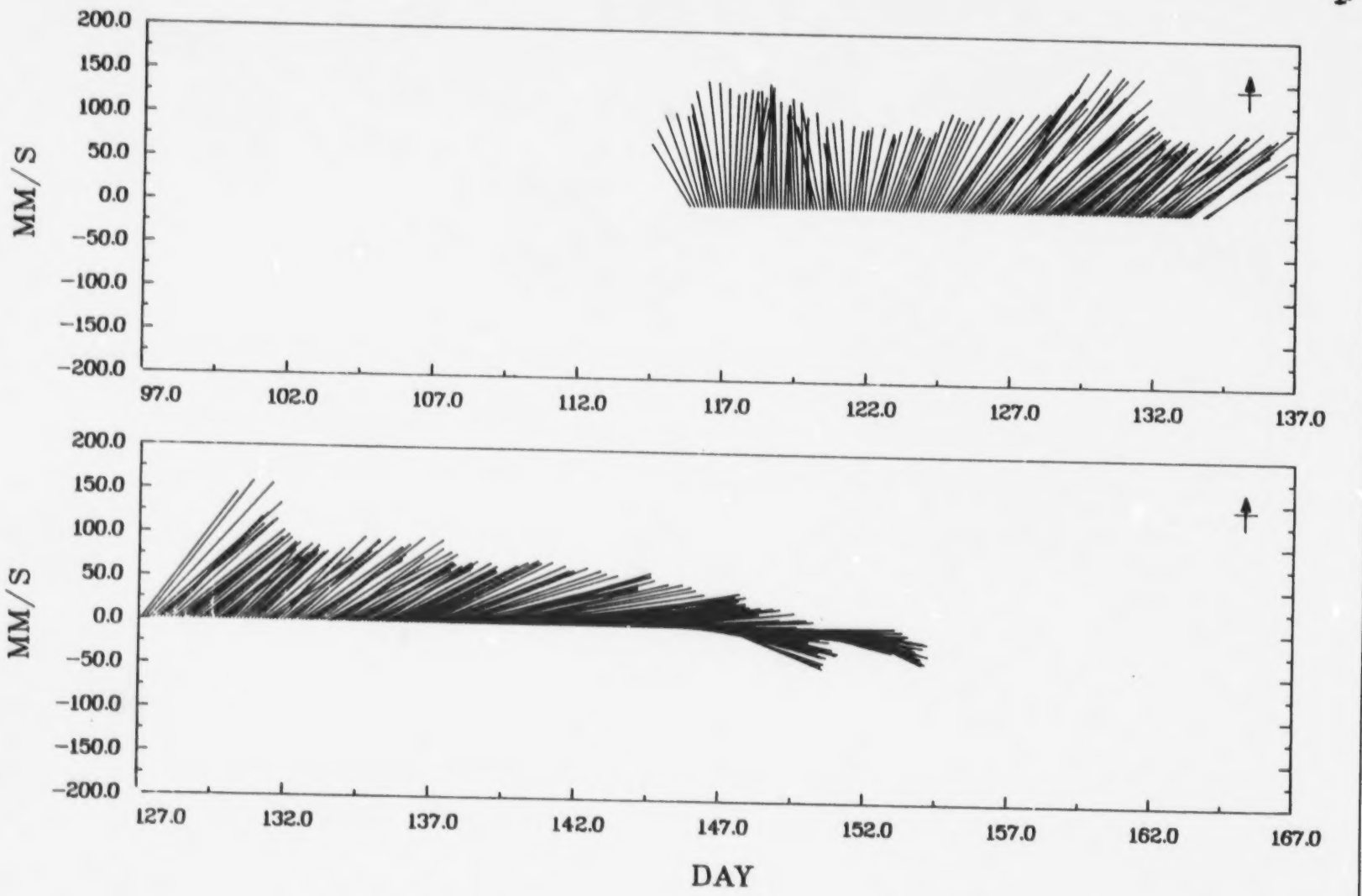
KILOMETRES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102.0
107.0
112.0
117.0
122.0
127.0
132.0
137.0
200.0
150.0
100.0
50.0
0.0
-50.0
-100.0
-150.0
-200.0
MM/S
127.0
132.0
137.0
142.0
147.0
152.0
157.0
162.0
167.0
DAY

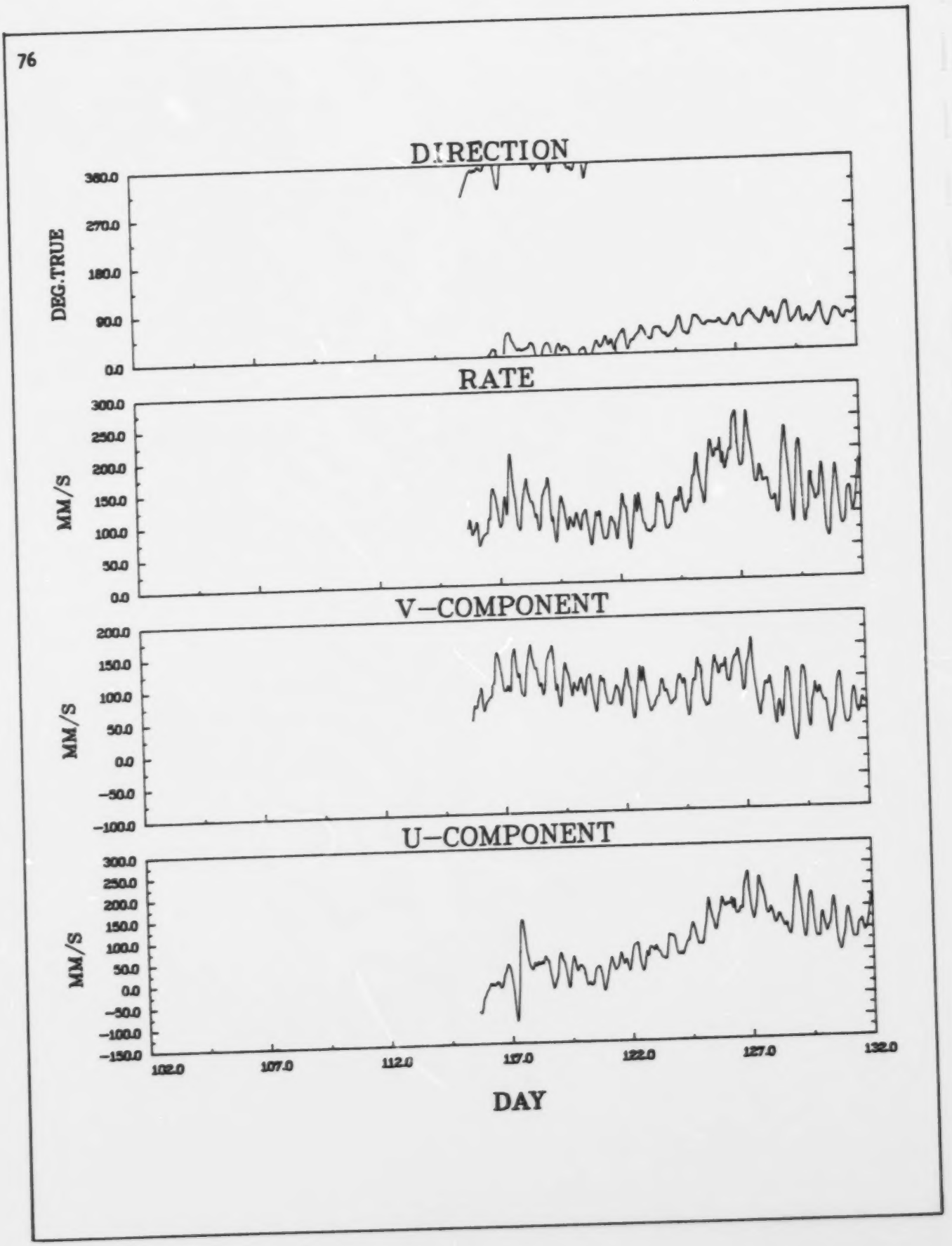
VELOCITIES RESOLVED ALONG 0. DEG. TRUE

CHAN	NAME	UNIT	NUMBER	MIN	MAX	MEAN	INTERCEPT	TREND(/SEC)	VARIANCE	STD. DEV.
1	U(18,4250M)	MM/S	2892	-.1349E+03	.3022E+03	.1128E+03	72.053	-.23485E-04	.72312E+04	.85036E+02
2	V(18,4250M)	MM/S	2892	-.1023E+03	.1719E+03	.3003E+02	114.804	-.48837E-04	.37243E+04	.61027E+02

R(18,4250M) VS D(18,4250M)

MM/S DEG.TRUE		SUB TOTAL	OUT OF RANGE	0.00 TO 50.00	50.00 TO 100.00	100.00 TO 150.00	150.00 TO 200.00	200.00 TO 250.00	250.00 TO 300.00	300.00 TO 350.00
340.00 TO	360.00	132	*	.2	2.9	1.4	.0			
320.00 TO	340.00	53	*	.3	1.3	.2				
300.00 TO	320.00	56	*	.2	.9	.8				
280.00 TO	300.00	67	*	.4	1.1	.8				
260.00 TO	280.00	9	*	.2	.1					
240.00 TO	260.00	6	*	.2						
220.00 TO	240.00	4	*	.1						
200.00 TO	220.00	4	*	.1						
180.00 TO	200.00	1	*	.0						
160.00 TO	180.00	2	*	.1						
140.00 TO	160.00	5	*	.1	.1					
120.00 TO	140.00	133	*	.2	.7	2.6	1.1			
100.00 TO	120.00	423	*	.2	.5	3.7	4.9	4.2	1.0	.1
80.00 TO	100.00	661	*	.1	1.0	1.6	9.6	7.9	2.7	
60.00 TO	80.00	543	*	.0	2.3	9.4	5.4	1.1	.4	
40.00 TO	60.00	350	*	.3	1.6	4.3	3.8	2.0	.2	
20.00 TO	40.00	217	*	.2	2.7	4.2	.3			
0.00 TO	20.00	226	*	.7	3.4	3.1	.6			
OUT OF RANGE		0	0							
SUB TOTAL		2892	0	109	540	931	745	441	124	

STATION 18 4250 m
24 APRIL-3 JUNE 1972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DEG.TRUE
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270.0
180.0
90.0
0.0
RATE
MM/S
300.0
250.0
200.0
150.0
100.0
50.0
0.0
V-COMPONENT
MM/S
200.0
150.0
100.0
50.0
0.0
-50.0
-100.0
U-COMPONENT
MM/S
300.0
250.0
200.0
150.0
100.0
50.0
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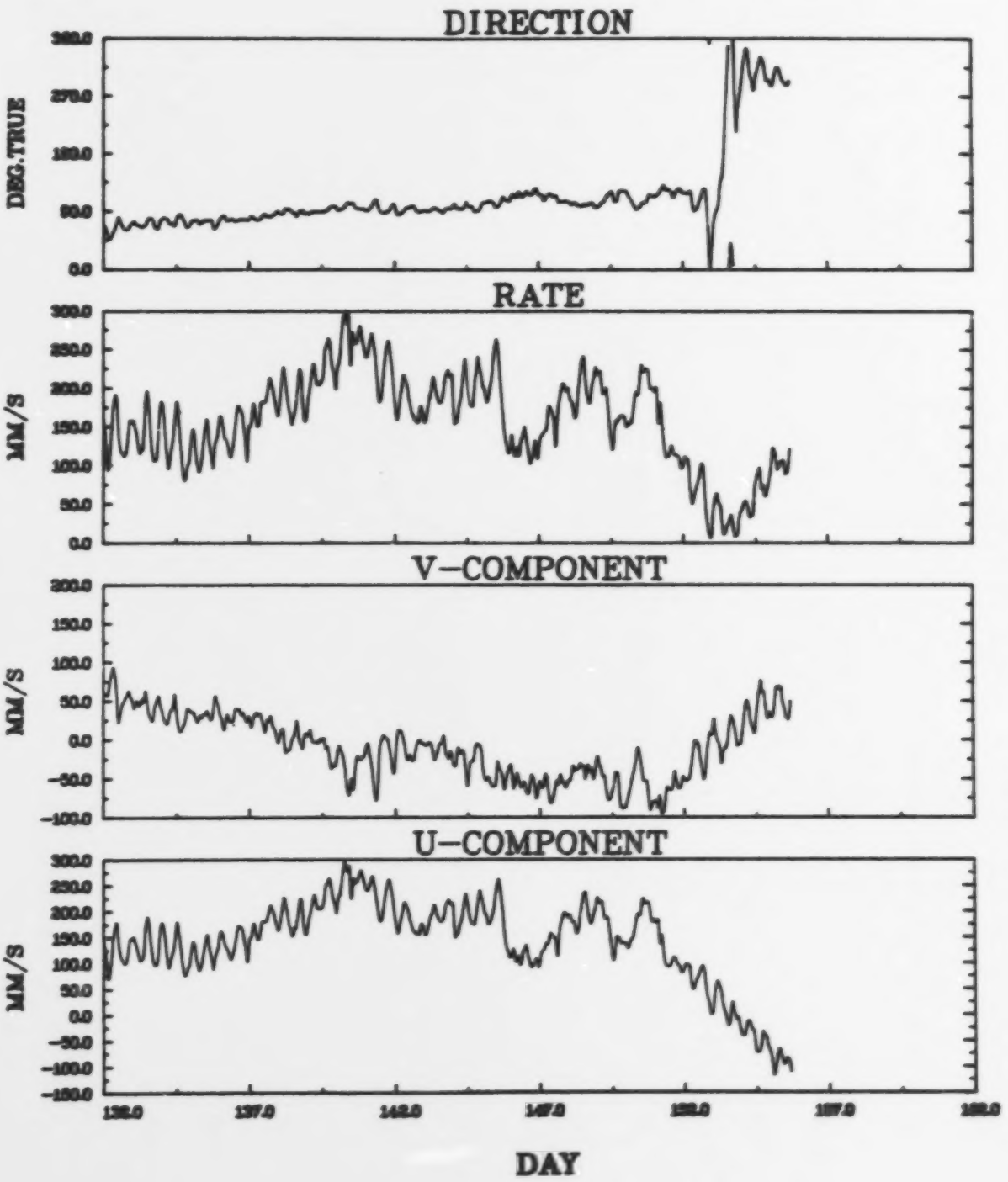
127.0
132.0
DAY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RATE
MM/S
300.0
250.0
200.0
150.0
100.0
50.0
0.0
V-COMPONENT
MM/S
200.0
150.0
100.0
50.0
0.0
-50.0
-100.0
U-COMPONENT
MM/S
300.0
250.0
200.0
150.0
100.0
50.0
0.0
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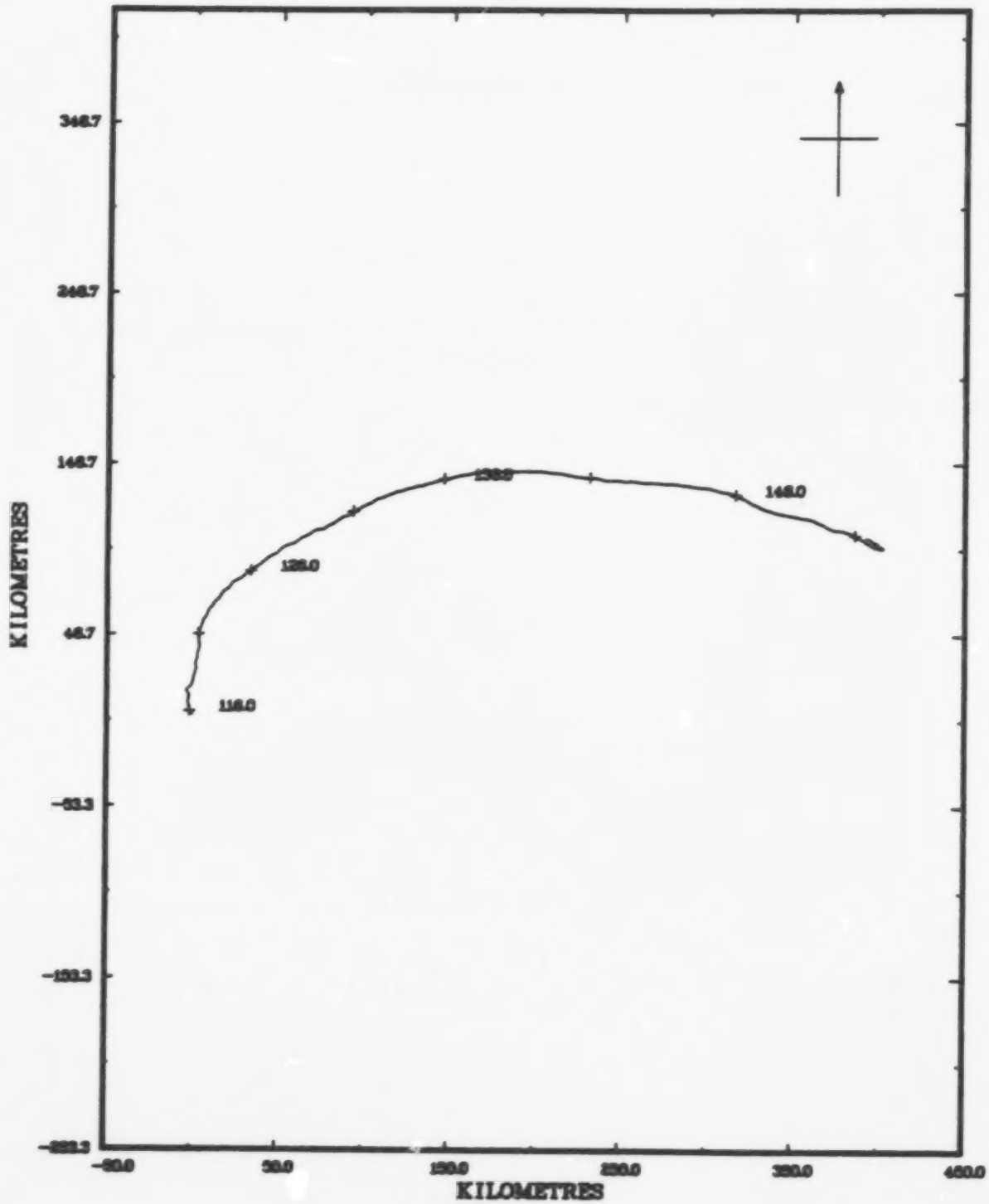
-150.0
132.0
137.0
142.0
147.0
152.0
157.0
162.0
DAY

78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KILOMETRES
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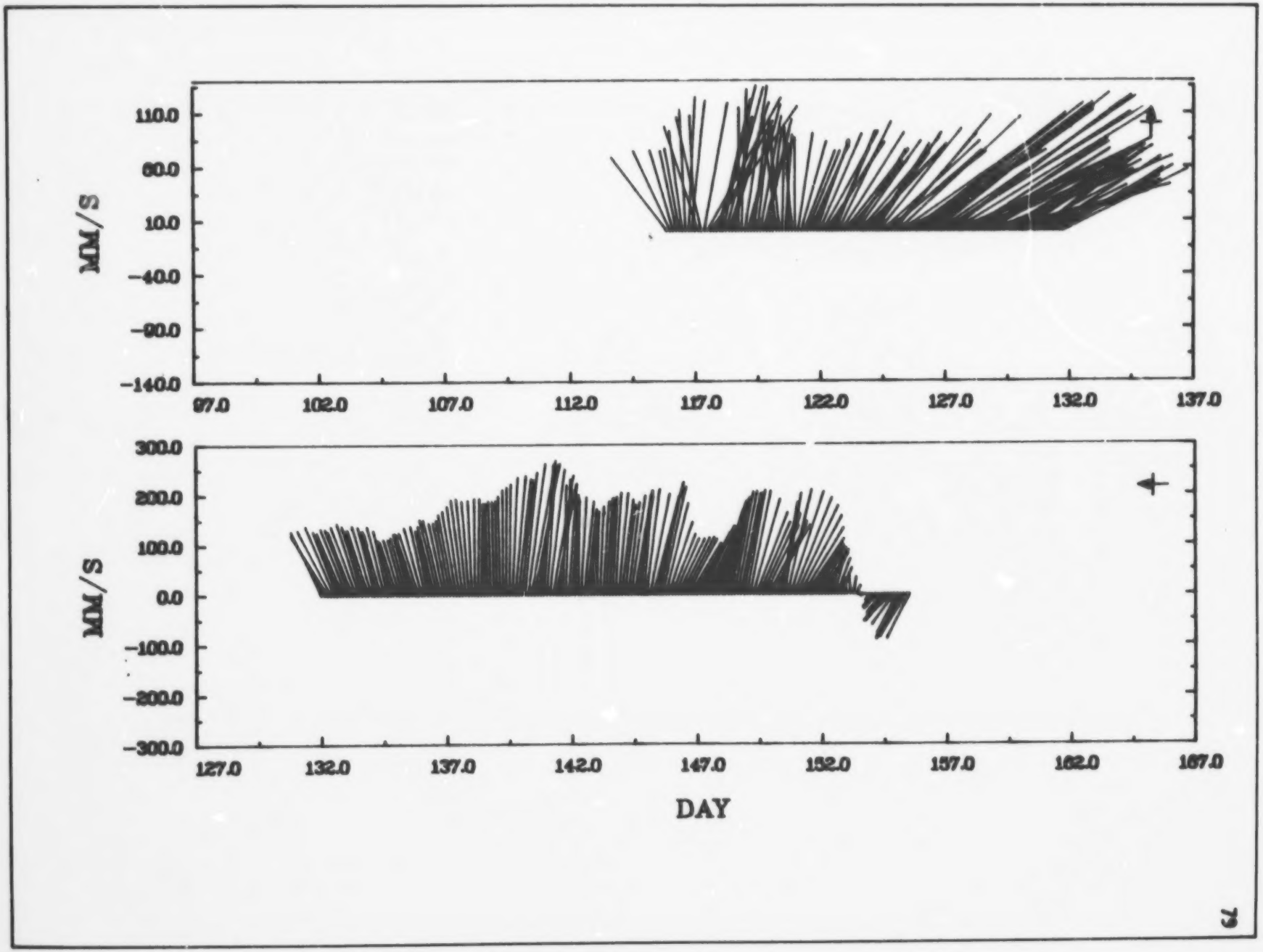
128.0
148.0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MM/S
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102.0
107.0
112.0
117.0
122.0
127.0
132.0
137.0
300.0
200.0
100.0
0.0
-100.0
-200.0
-300.0
MM/S
127.0
132.0
137.0
142.0
147.0
152.0
157.0
162.0
167.0
DAY

VELOCITIES RESOLVED ALONG 0. DEG. TRUE

CHAN	NAME	UNIT	NUMBER	MIN	MAX	MEAN	INTERCEPT	TREND(/SEC)	VARIANCE	STD. DEV.
1	U(19,3250M)	MM/S	2844	-.1008E+03	.2256E+03	.3540E+02	-19.606	.32224E-04	.49623E+04	.70493E+02
2	V(19,3250M)	MM/S	2844	-.1153E+03	.2078E+03	.9822E+00	88.762	-.51130E-04	.42847E+04	.65458E+02

U(19,3250M) VS D(19,3250M)

MM/S DEG.TRUE		SUM TOTAL	OUT OF RANGE	0.00 TO 50.00	50.00 TO 100.00	100.00 TO 150.00	150.00 TO 200.00	200.00 TO 250.00
340.00 TO	360.00	174	*	2.5	2.8	3.4	4.1	.4
320.00 TO	340.00	242	*	3.4	2.0	2.4	1.7	.0
300.00 TO	320.00	111	*	2.7	1.2			
280.00 TO	300.00	72	*	2.0	.5			
260.00 TO	280.00	84	*	1.9	1.1			
240.00 TO	260.00	100	*	2.8	.7			
220.00 TO	240.00	58	*	1.4	.6			
200.00 TO	220.00	34	*	.8	.4			
180.00 TO	200.00	52	*	1.2	.5			
160.00 TO	180.00	56	*	1.3	.7			
140.00 TO	160.00	92	*	1.0	2.2	.0		
120.00 TO	140.00	339	*	1.3	4.4	4.4	1.8	.1
100.00 TO	120.00	728	*	3.4	4.8	4.8	2.2	2.4
80.00 TO	100.00	239	*	4.0	3.4	.9	.1	
60.00 TO	80.00	50	*	1.1	.7			
40.00 TO	60.00	54	*	1.2	.1			
20.00 TO	40.00	53	*	1.2				
0.00 TO	20.00	106	*	2.2	.4	.1		.0
OUT OF RANGE		0	0					
SUM TOTAL		2844	0	1039	756	515	452	82

STATION 19 3250 m

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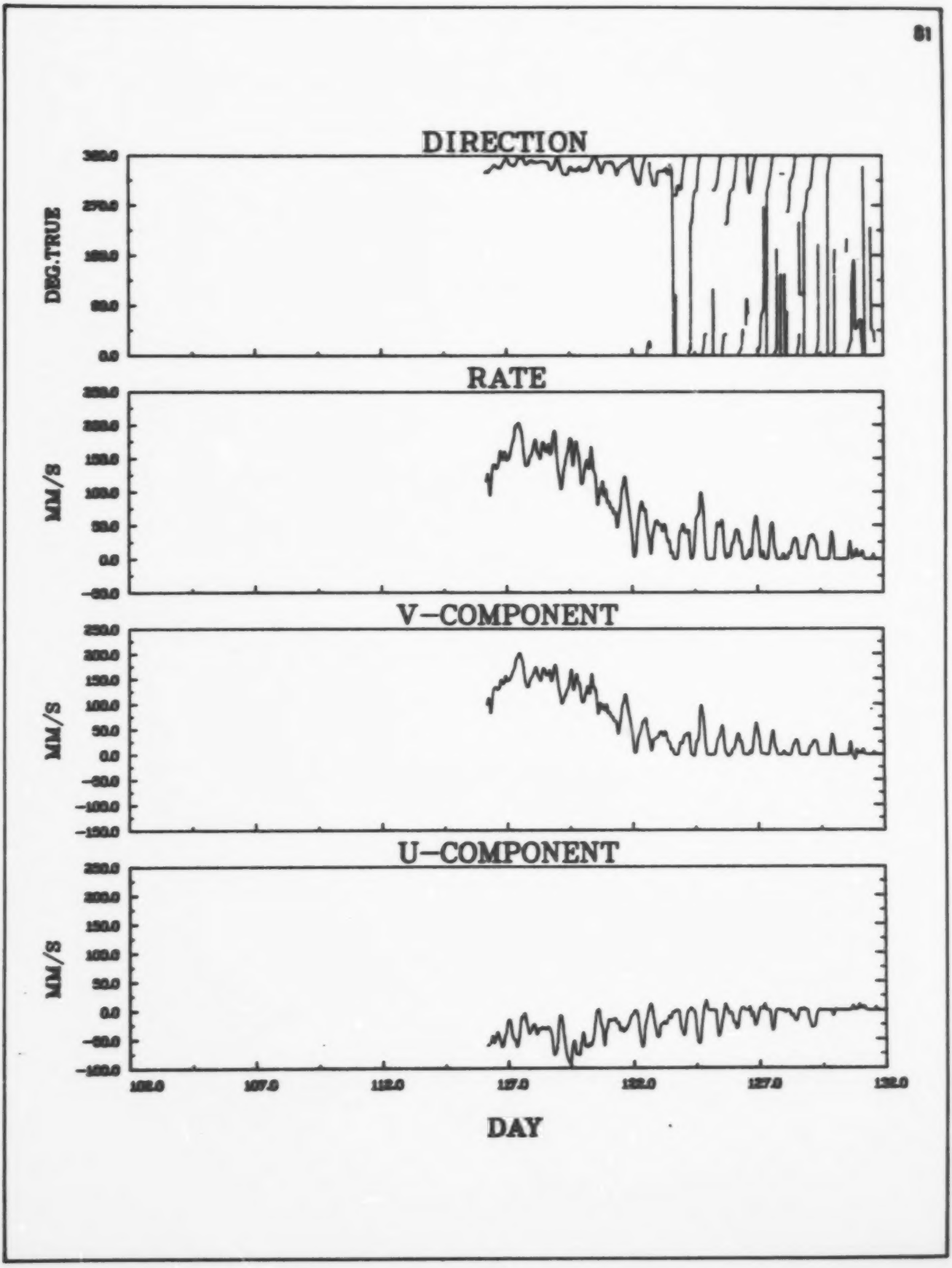
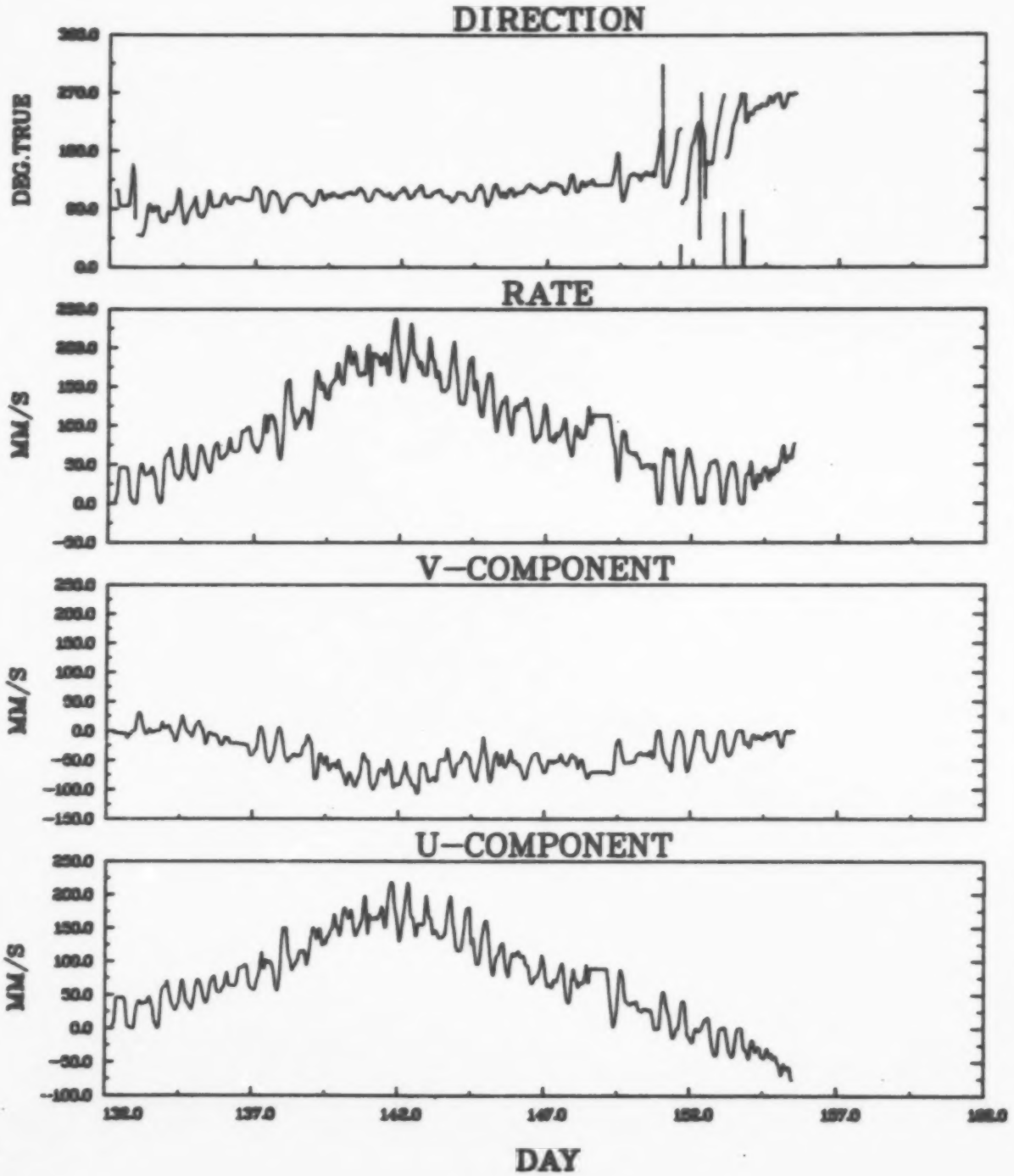

DIRECTION
DEG.TRUE
RATE
MM/S
V-COMPONENT
MM/S
U-COMPONENT
MM/S
DAY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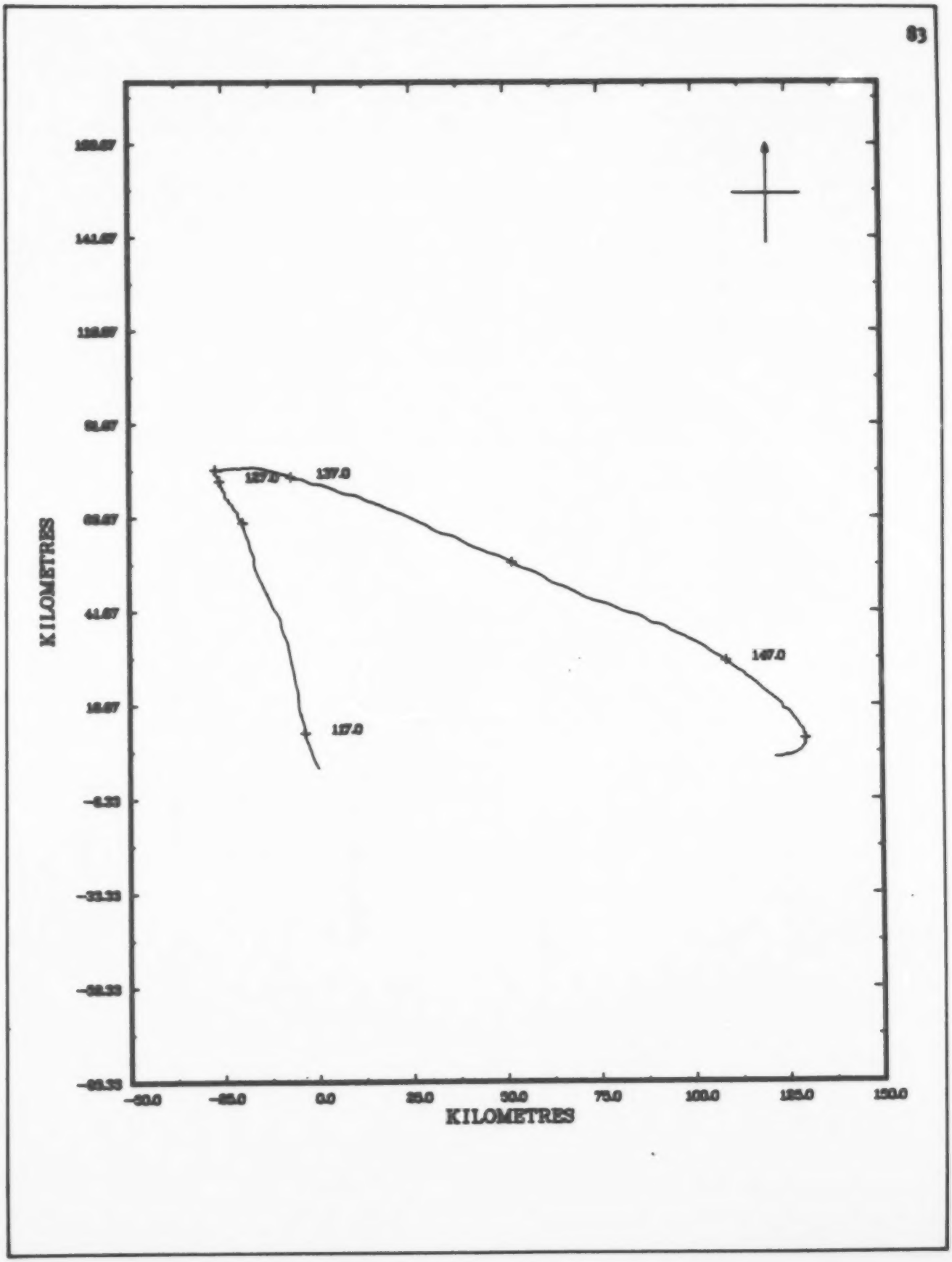
DEG.TRUE
RATE
MM/S
V-COMPONENT
MM/S
U-COMPONENT
MM/S
DAY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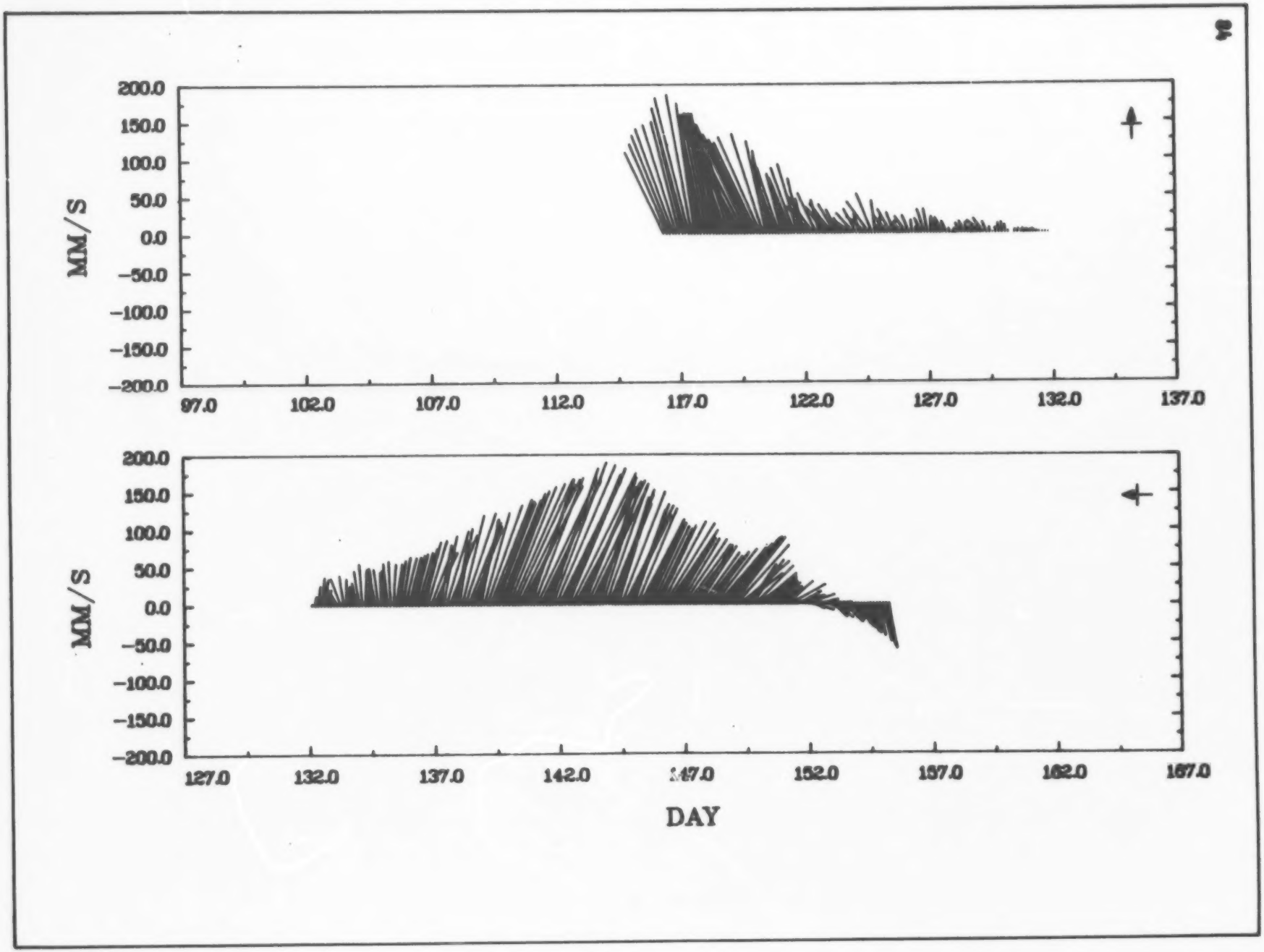
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102.0
107.0
112.0
117.0
122.0
127.0
132.0
137.0
MM/S
200.0
150.0
100.0
50.0
0.0
-50.0
-100.0
-150.0
-200.0
127.0
132.0
137.0
142.0
147.0
152.0
157.0
162.0
167.0
DAY

VELOCITIES RESOLVED ALONG 0. DEG. TRUE

CHAN	NAME	UNIT	NUMBER	MIN	MAX	MEAN	INTERCEPT	TREND(/SEC)	VARIANCE	STD. DEV.
1	U(19,3750M)	MM/S	2856	-.1482E+03	.2413E+03	.3991E+02	-36.600	-.446366-04	.66897E+04	.81791E+02
2	V(19,3750M)	MM/S	2856	-.1358E+03	.2260E+03	-.1823E+01	93.221	-.95445E-04	.46524E+04	.68208E+02

P(19,3750M) VS D(19,3750M)

MM/S

DEG.TRUE		SUB TOTAL	OUT OF RANGE	0.00 TO 50.00	50.00 TO 100.00	100.00 TO 150.00	150.00 TO 200.00	200.00 TO 250.00	250.00 TO 300.00
340.00 TO	360.00	260	*	2.5	.9	1.9	2.6	1.2	
320.00 TO	340.00	249	*	1.7	2.0	2.5	2.1	.3	
300.00 TO	320.00	198	*	1.9	2.2	.7	.6	.0	
280.00 TO	300.00	91	*	1.8	1.2	.1			
260.00 TO	280.00	117	*	2.3	1.5	.0			
240.00 TO	260.00	88	*	1.8	1.3				
220.00 TO	240.00	46	*	1.6					
200.00 TO	220.00	75	*	2.0	.7				
180.00 TO	200.00	57	*	1.3	.5				
160.00 TO	180.00	79	*	1.1	1.7				
140.00 TO	160.00	112	*	.8	2.7	.4			
120.00 TO	140.00	287	*	1.4	2.1	4.6	1.6	.3	
100.00 TO	120.00	774	*	1.9	3.7	7.3	10.0	4.1	.1
80.00 TO	100.00	188	*	1.7	2.9	1.6	.3	.0	
60.00 TO	80.00	119	*	1.8	2.4				
40.00 TO	60.00	39	*	1.1	.2				
20.00 TO	40.00	41	*	1.3	.1				
0.00 TO	20.00	86	*	2.0	.6	.4	.0		
OUT OF RANGE		0	0						
SUB TOTAL		2856	0	857	764	562	497	172	

STATION 19 3750 m

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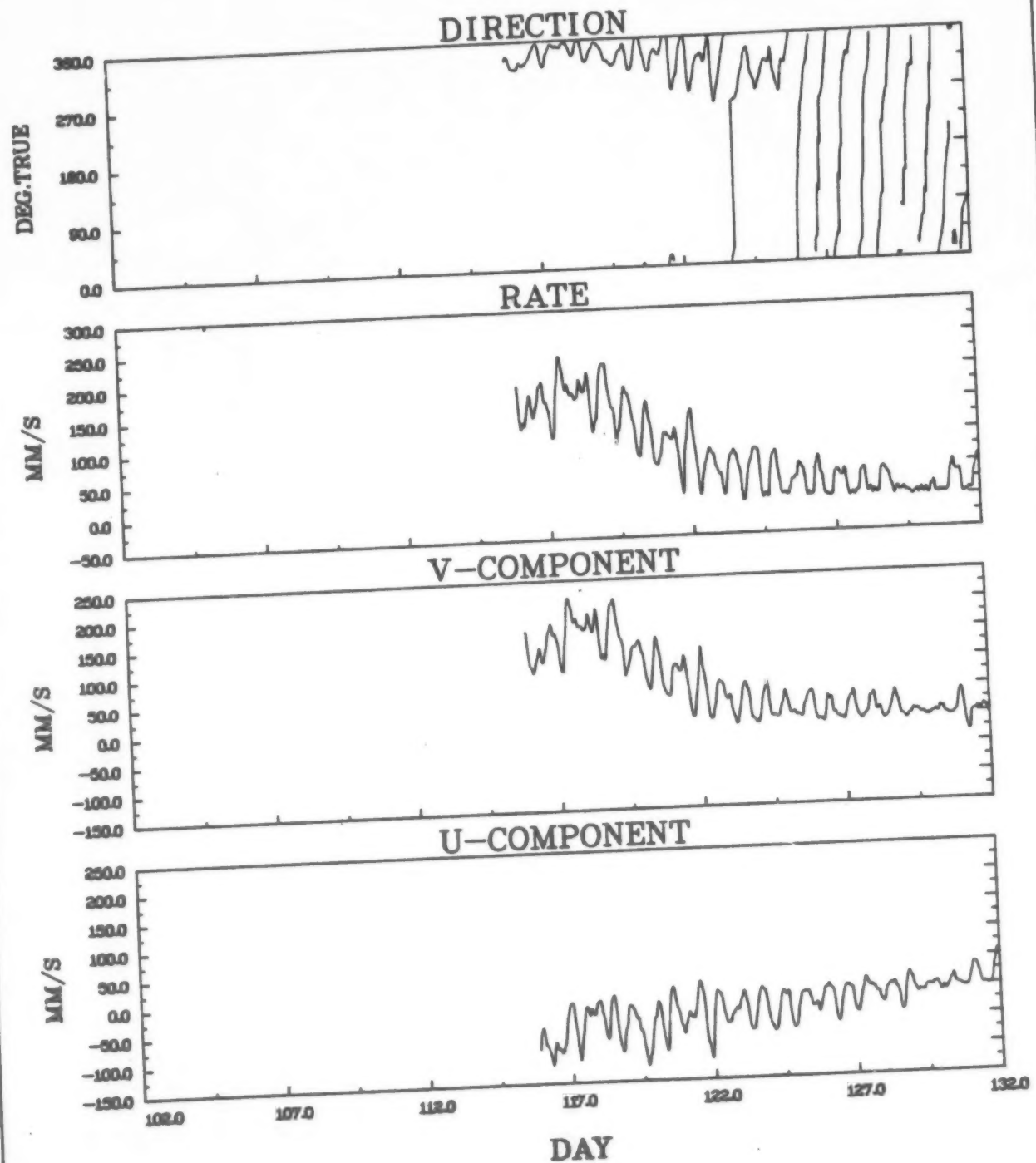
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RATE
MM/S
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150.0
100.0
50.0
0.0
-50.0
V-COMPONENT
MM/S
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200.0
150.0
100.0
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-50.0
-100.0
-150.0
U-COMPONENT
MM/S
250.0
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150.0
100.0
50.0
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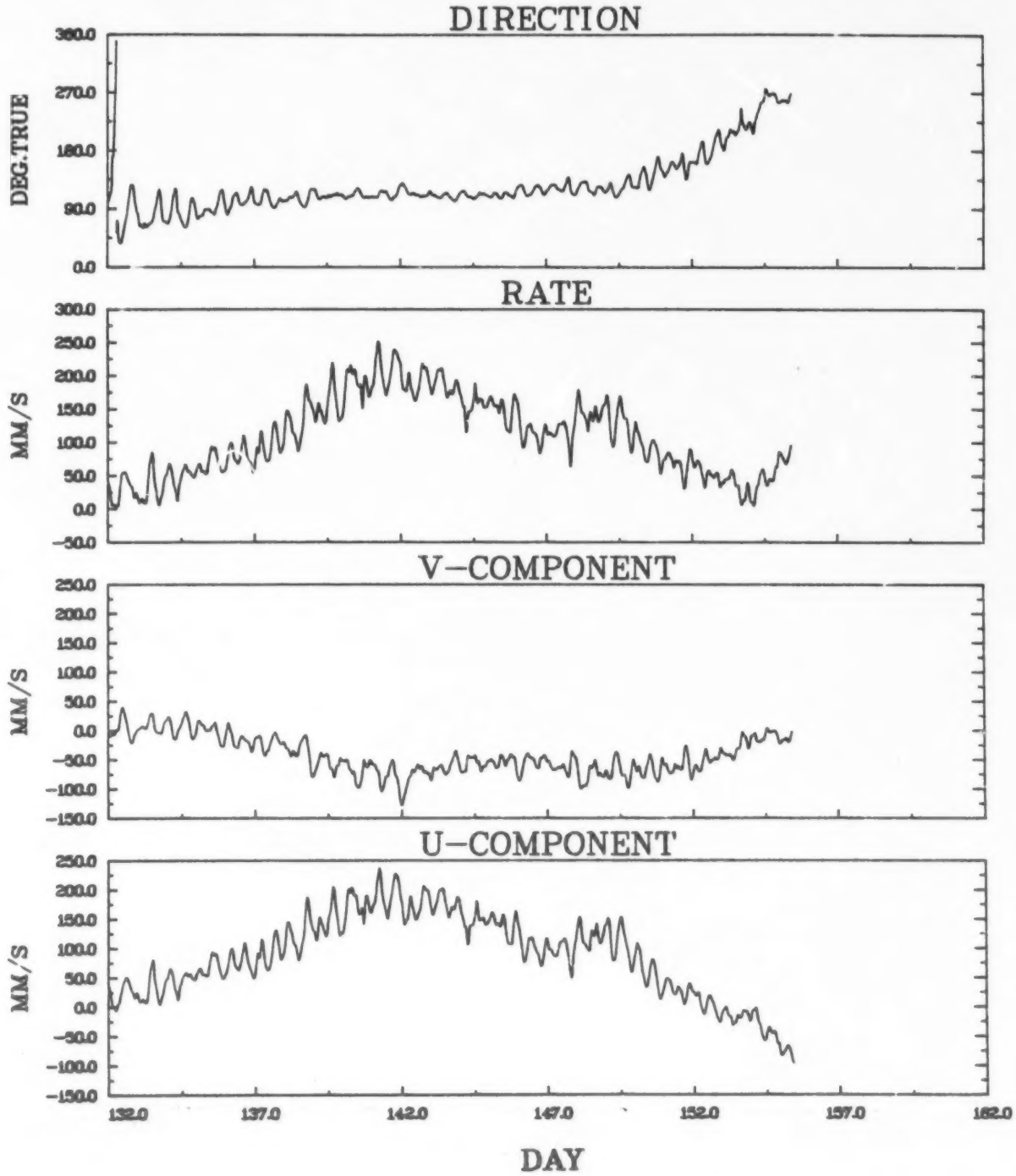
DAY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180.0
90.0
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RATE
MM/S
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200.0
150.0
100.0
50.0
0.0
-50.0
V-COMPONENT
MM/S
250.0
200.0
150.0
100.0
50.0
0.0
-50.0
-100.0
-150.0
U-COMPONENT
MM/S
250.0
200.0
150.0
100.0
50.0
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147.0
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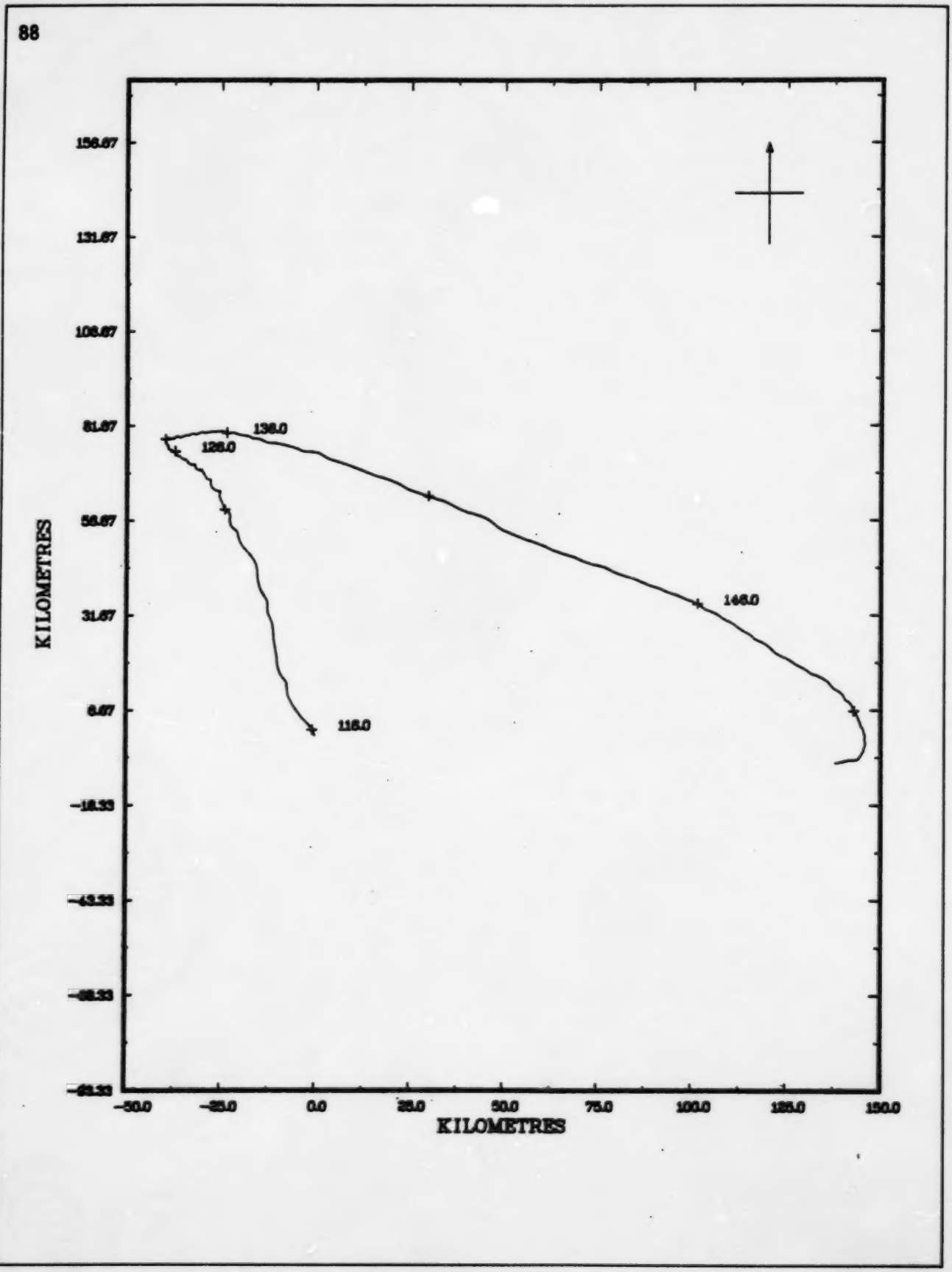
DAY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KILOMETRES
-50.0
-25.0
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KILOMETRES
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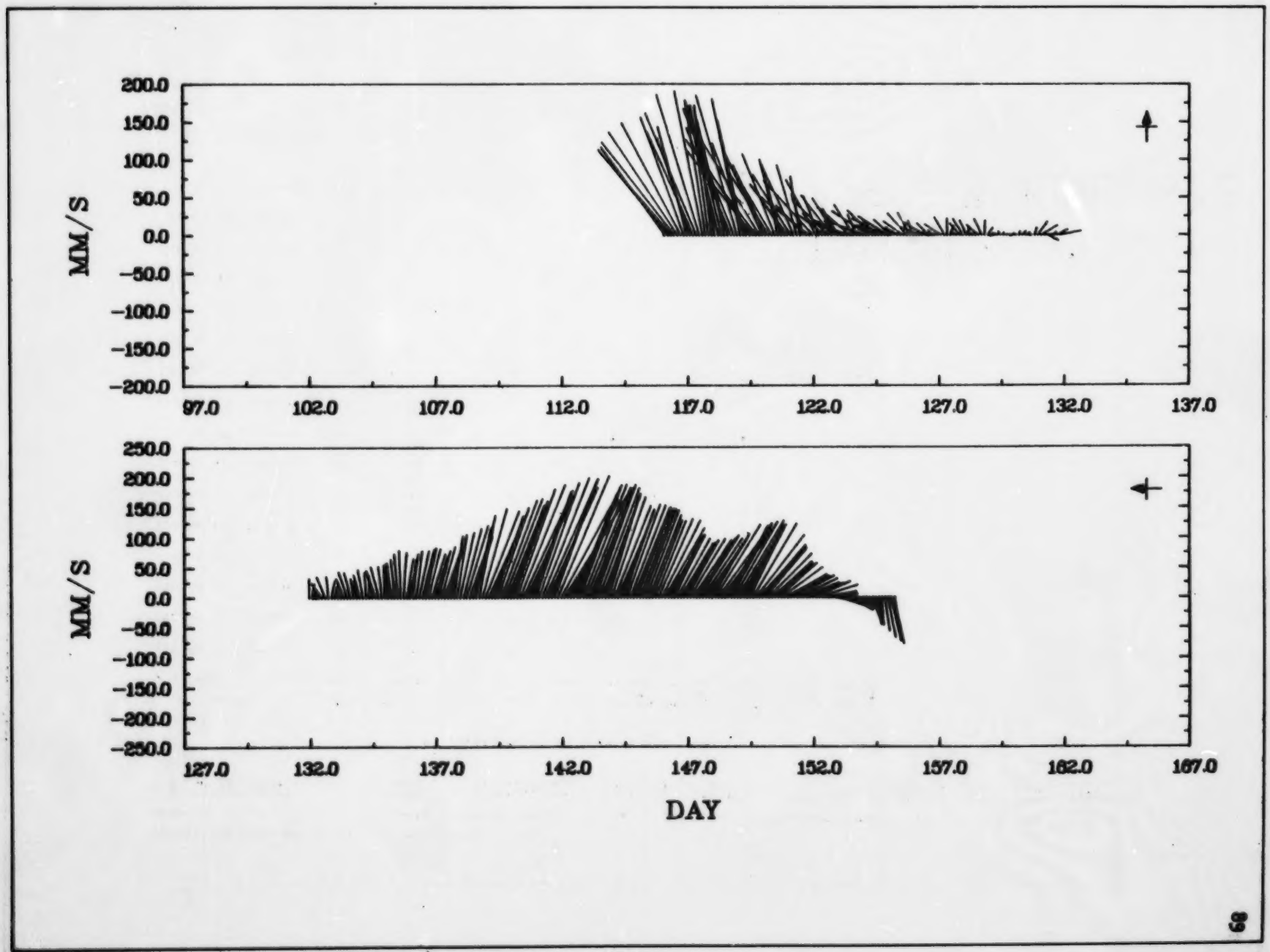
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127.0
132.0
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100.0
50.0
0.0
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-250.0
MM/S
127.0
132.0
137.0
142.0
147.0
152.0
157.0
162.0
167.0
DAY

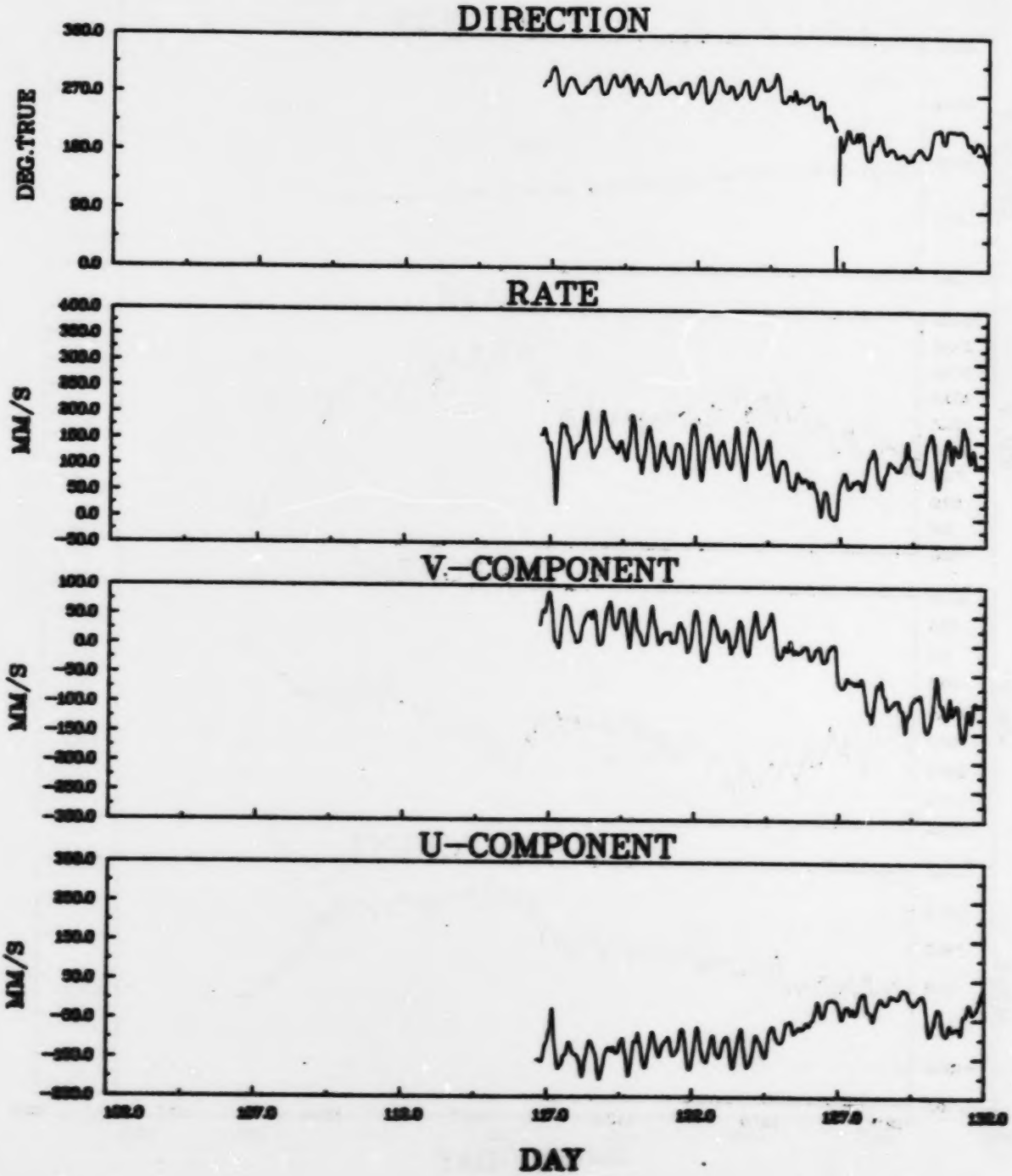
VELOCITIES RESOLVED ALONG 0. DEG. TRUE

CHAN	NAME	UNIT	NUMBER	MIN	MAX	MEAN	INTERCEPT	TREND(/SEC)	VARIANCE	STD. DEV.
1	U(20.4150M)	CM/S	2784	-.2110E+03	.3232E+03	.3263E+02	-149.998	-.121206E-03	.18437E+05	.13578E+03
2	V(20.4150M)	CM/S	2784	-.2734E+03	.1001E+03	-.8647E+02	-19.431	-.446088E-04	.66938E+04	.81571E+02

R(20.4150M) VS D(20.4150M)

CM/S DEG.TRUE		SUB TOTAL	OUT OF RANGE	0.00 TO 50.00	50.00 TO 100.00	100.00 TO 150.00	150.00 TO 200.00	200.00 TO 250.00	250.00 TO 300.00	300.00 TO 350.00	350.00 TO 400.00
300.00 TO	320.00	40	*		.4	1.0	.0				
280.00 TO	300.00	329	*	.1	1.8	6.3	3.4	.?			
260.00 TO	280.00	285	*	.2	2.4	4.6	2.6	.4			
240.00 TO	260.00	47	*	.3	1.0	.4					
220.00 TO	240.00	23	*	.6	.2						
200.00 TO	220.00	122	*	.3	1.6	1.8	.7				
180.00 TO	200.00	172	*	.7	2.5	2.5	.9				
160.00 TO	180.00	355	*	.8	1.7	3.6	3.4	2.8	.4		
140.00 TO	160.00	390	*	.7	.0	1.4	3.6	6.9	1.3		
120.00 TO	140.00	629	*	.6	1.8	1.9	4.6	7.3	2.0	4.0	.4
100.00 TO	120.00	382	*	.3			.9	3.9	7.1	1.8	.1
80.00 TO	100.00		*								
60.00 TO	80.00		*								
40.00 TO	60.00		*								
20.00 TO	40.00		*								
0.00 TO	20.00	10	*	.4							
OUT OF RANGE		0	0								
SUB TOTAL		2784	0	137	377	654	541	597	301	162	15

STATION 20 4150 m
25 APRIL-3 JUNE 1972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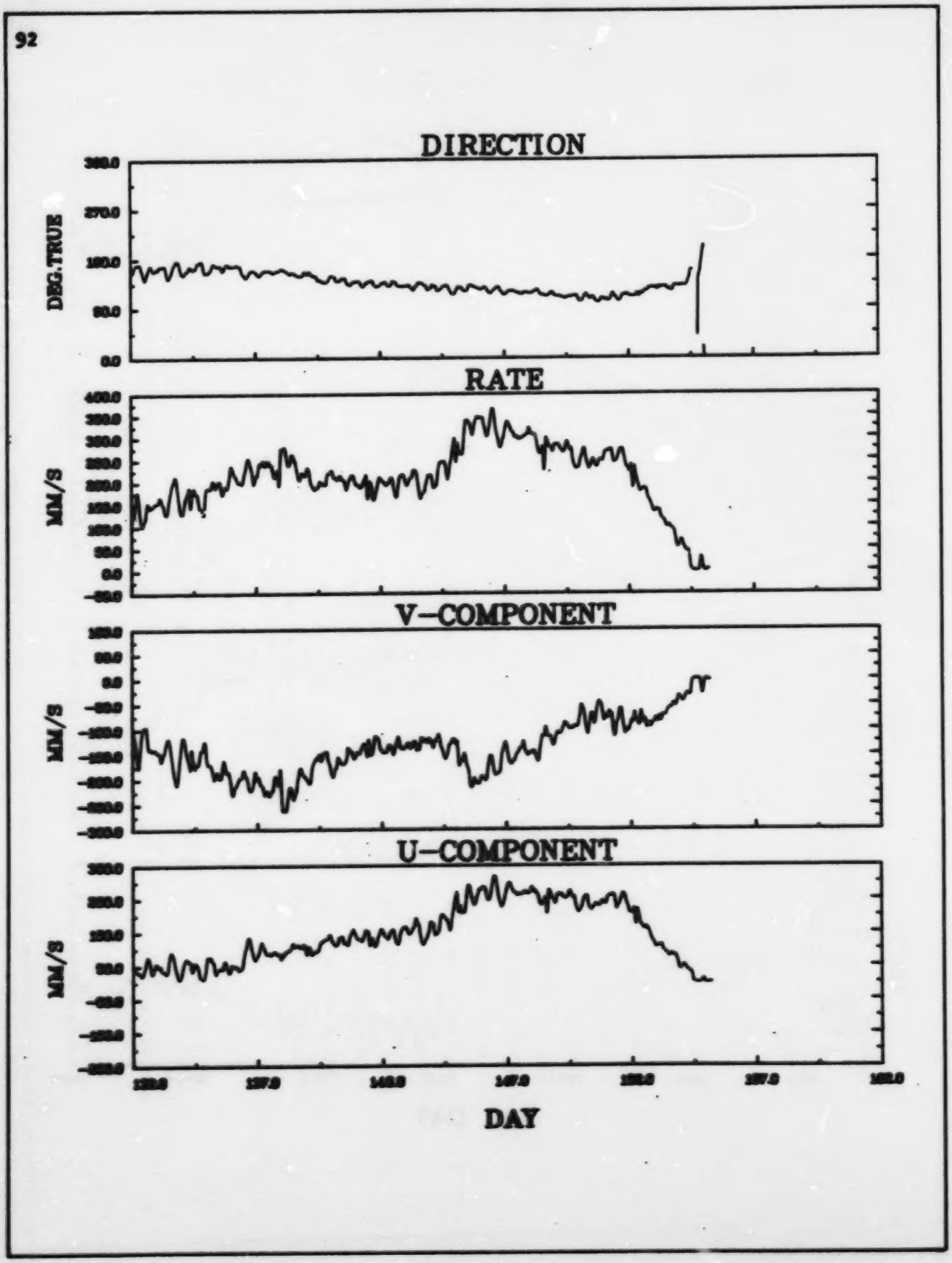
V-COMPONENT
MM/S
U-COMPONENT
MM/S
DAY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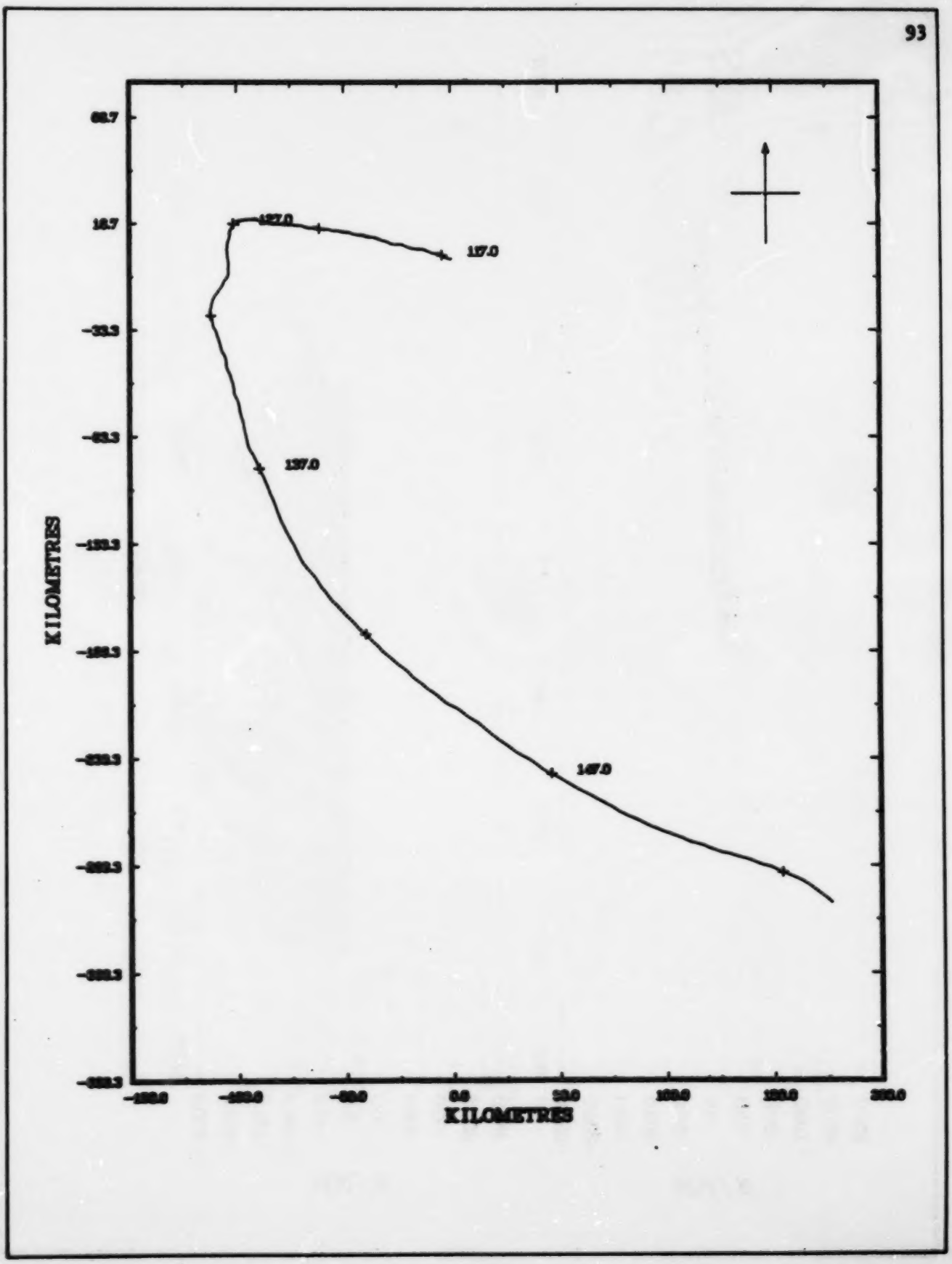
DEG.TRUE
RATE
CM/S
V-COMPONENT
CM/S
U-COMPONENT
CM/S
DAY


KILOMETRES
KILOMETRES
127.0
137.0
147.0

CM/S
DAY

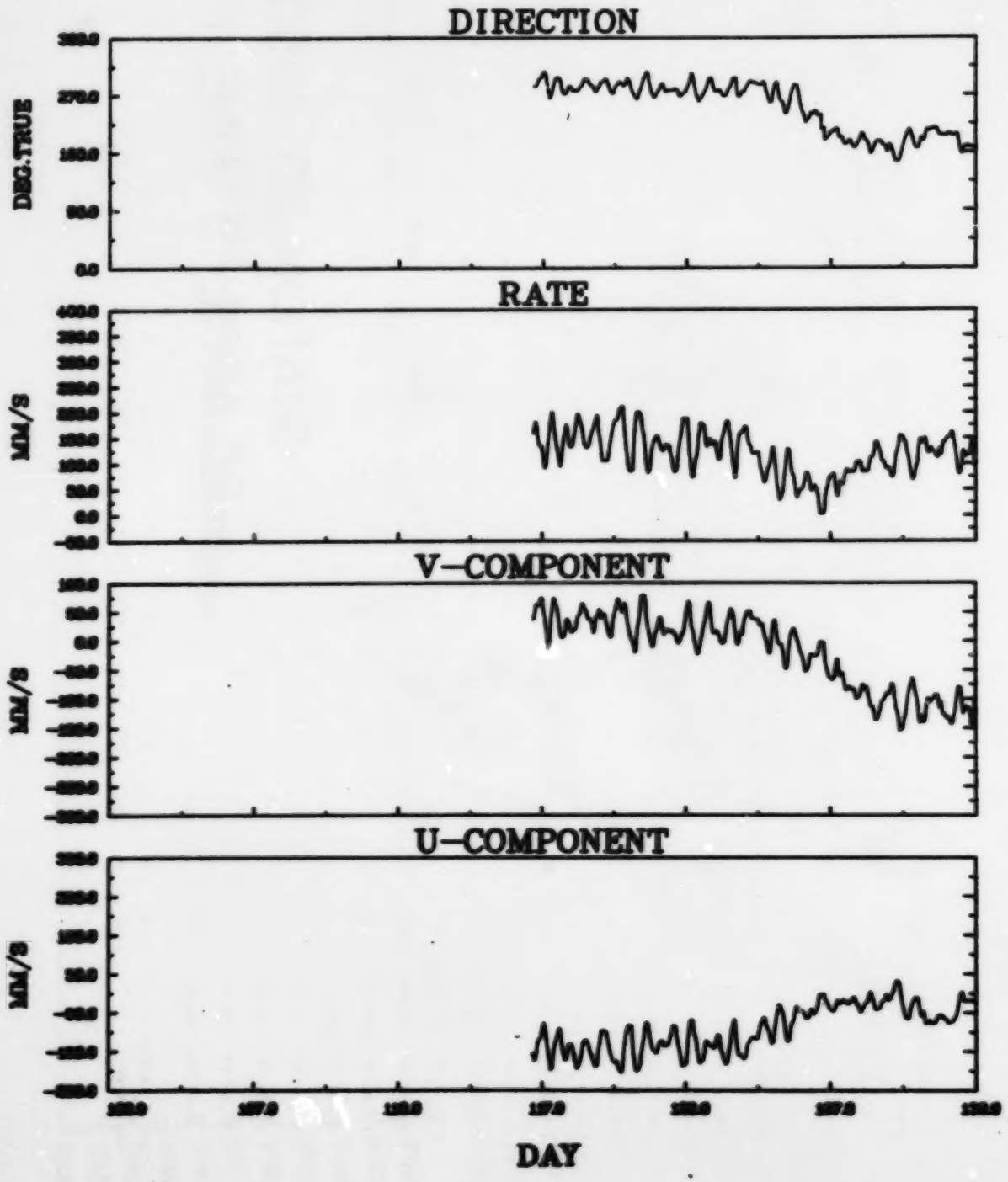
VELOCITIES RESOLVED ALONG 0. DEG. TRUE

CHAN	NAME	UNIT	NUMBER	MIN	MAX	MEAN	INTERCEPT	TREND(/SEC)	VARIANCE	STD. DEV.
1	V(20.4650M)	CM/S	7784	-.51736E+03	.31172E+03	-.44886E+02	-137.411	-.16097E-03	.18502E+05	.13203E+03
2	V(20.4650M)	CM/S	7784	-.24104E+03	.84266E+02	-.44586E+02	-12.416	-.44457E-04	.75966E+04	.86894E+02

V(20.4650M) VS D(20.4650M)

DEG.TRUE	CM/S	SUB TOTAL	OUT OF RANGE	0.00 TO 50.00	50.00 TO 100.00	100.00 TO 150.00	150.00 TO 200.00	200.00 TO 250.00	250.00 TO 300.00	300.00 TO 350.00	350.00 TO 400.00
300.00 TO	320.00	94	*		.2	.6	.1				
280.00 TO	300.00	320	*	.1	2.0	5.0	3.9	.5			
260.00 TO	280.00	290	*	.4	1.7	4.3	3.7	.4			
240.00 TO	260.00	91	*	.5	.7	.6					
220.00 TO	240.00	42	*	.6	.8	.1					
200.00 TO	220.00	183	*	.9	2.0	3.0	.6				
180.00 TO	200.00	201	*	.4	3.1	2.8	.8	.1			
160.00 TO	180.00	457	*	.7	.8	3.1	5.6	4.1	2.3		
140.00 TO	160.00	372	*	.9	.5	.7	4.6	5.9	.4	.0	.3
120.00 TO	140.00	906	*	.3	.6	1.5	7.0	9.6	2.8	3.9	1.4
100.00 TO	120.00	928	*	.1	.4	.4	.4	4.3	4.5	1.5	.3
80.00 TO	100.00		*								
60.00 TO	80.00		*								
40.00 TO	60.00		*								
20.00 TO	40.00		*								
0.00 TO	20.00	10	*	.4							
OUT OF RANGE		0	0								
SUB TOTAL		7784	0	144	394	616	604	583	279	152	57

STATION 20 4650 m
25 APRIL-3 JUNE 1972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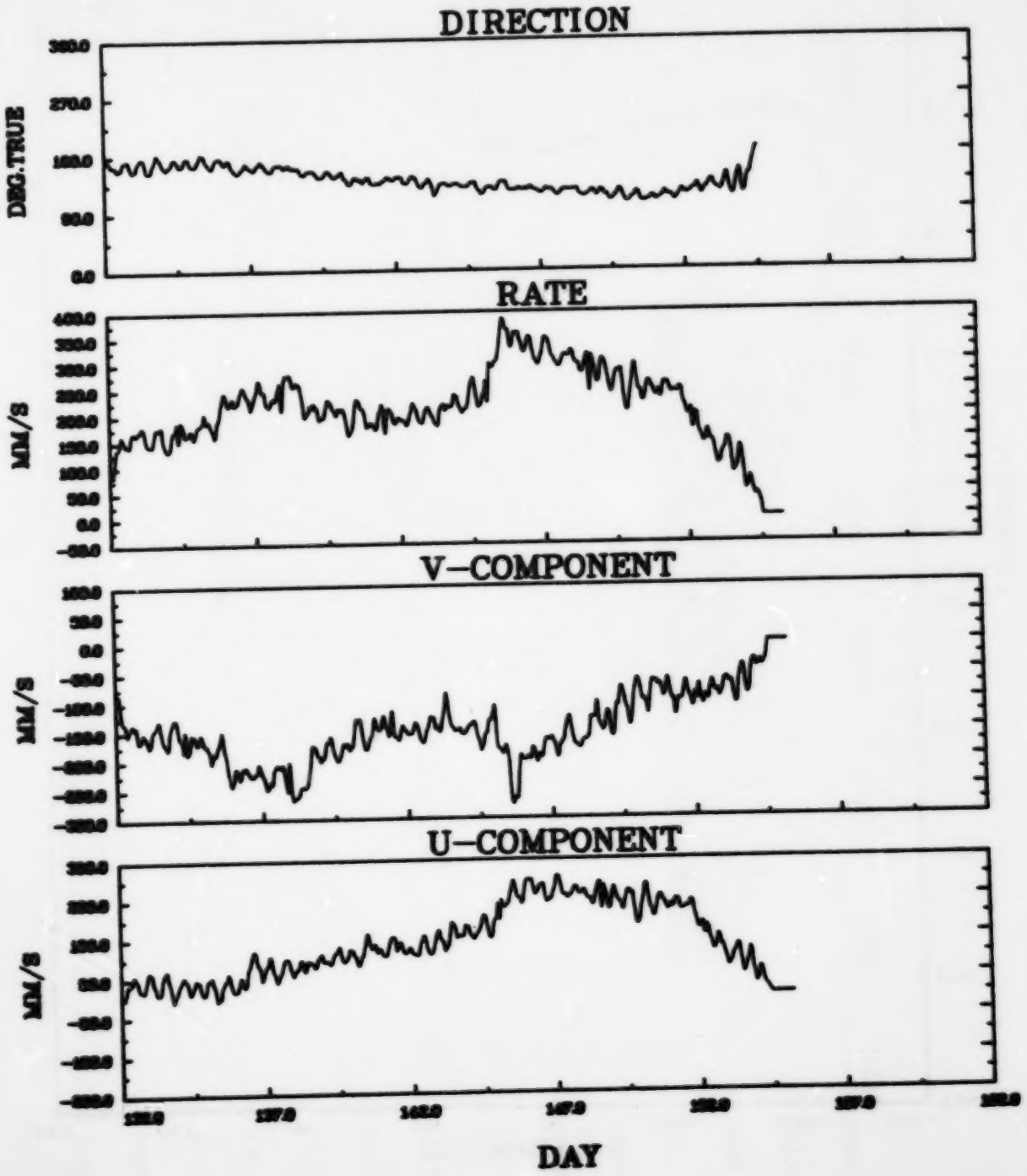
DEG.TRUE
RATE
MM/S
V-COMPONENT
MM/S
U-COMPONENT
MM/S
DAY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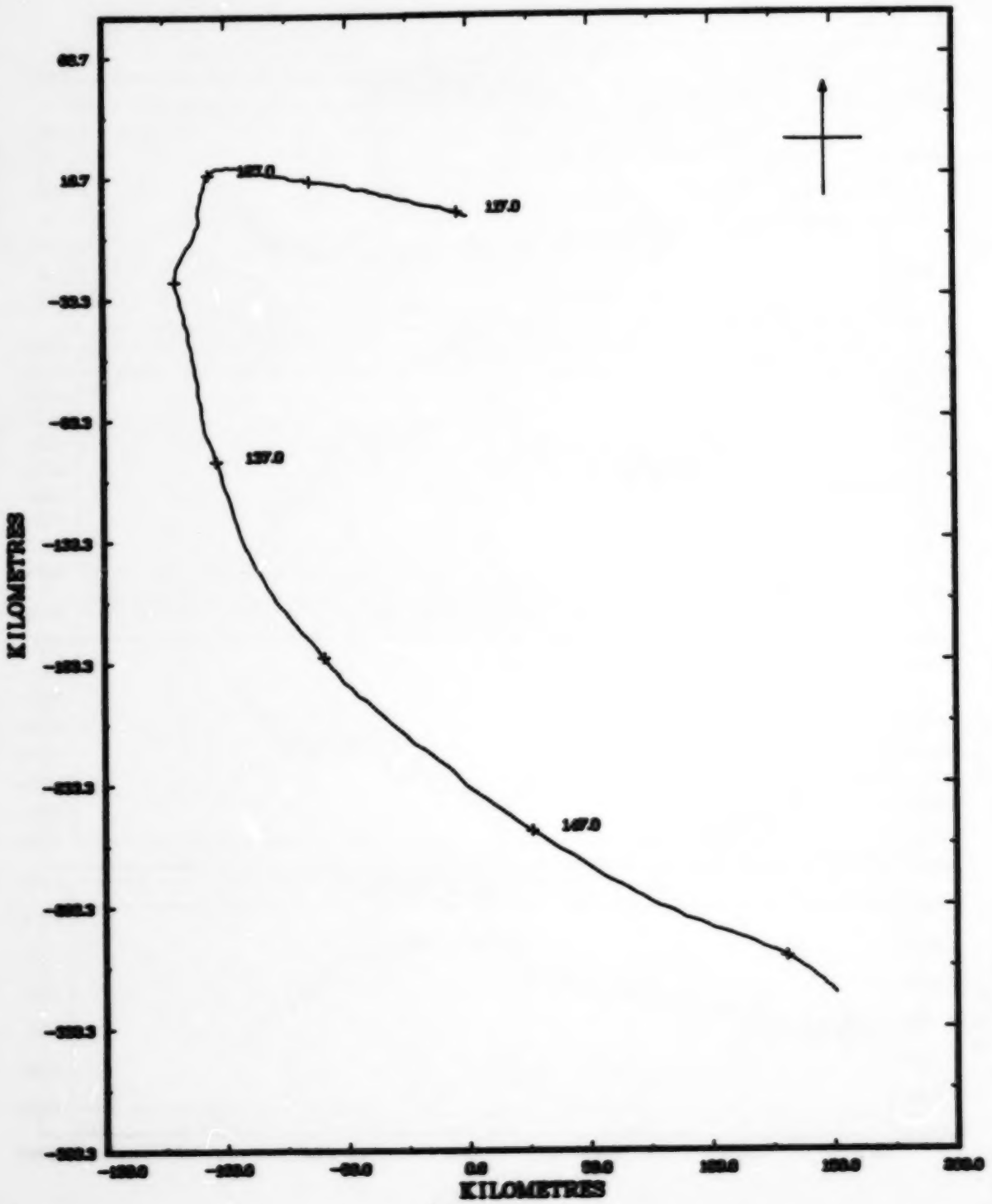
DEG.TRUE
RATE
KM/S
V-COMPONENT
KM/S
U-COMPONENT
KM/S
DAY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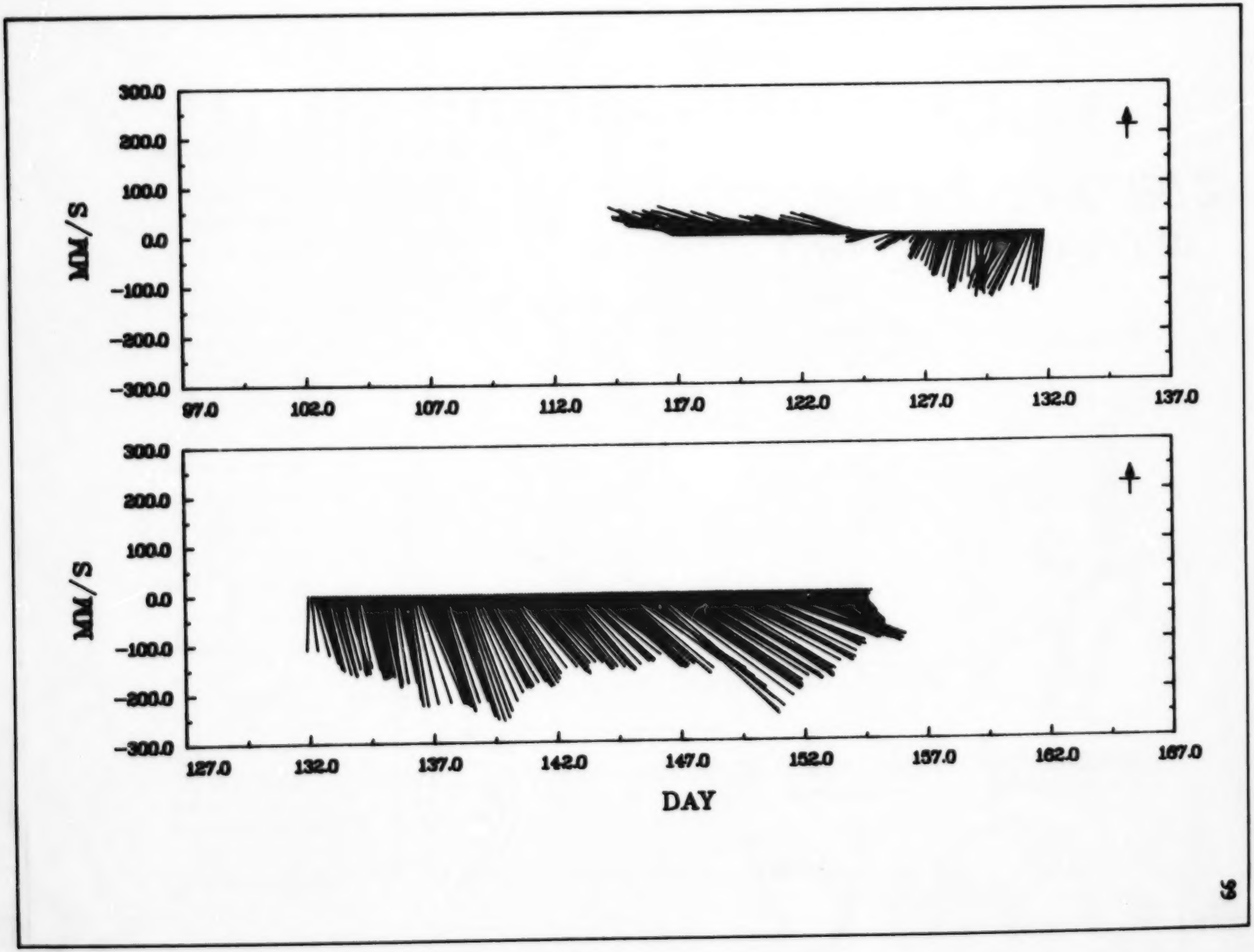
KILOMETRES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200.0
100.0
0.0
-100.0
-200.0
-300.0
MM/S
97.0
102.0
107.0
112.0
117.0
122.0
127.0
132.0
137.0
300.0
200.0
100.0
0.0
-100.0
-200.0
-300.0
MM/S
127.0
132.0
137.0
142.0
147.0
152.0
157.0
162.0
167.0
DAY

VELOCITIES RESOLVED ALONG 0. DEG. TRUE

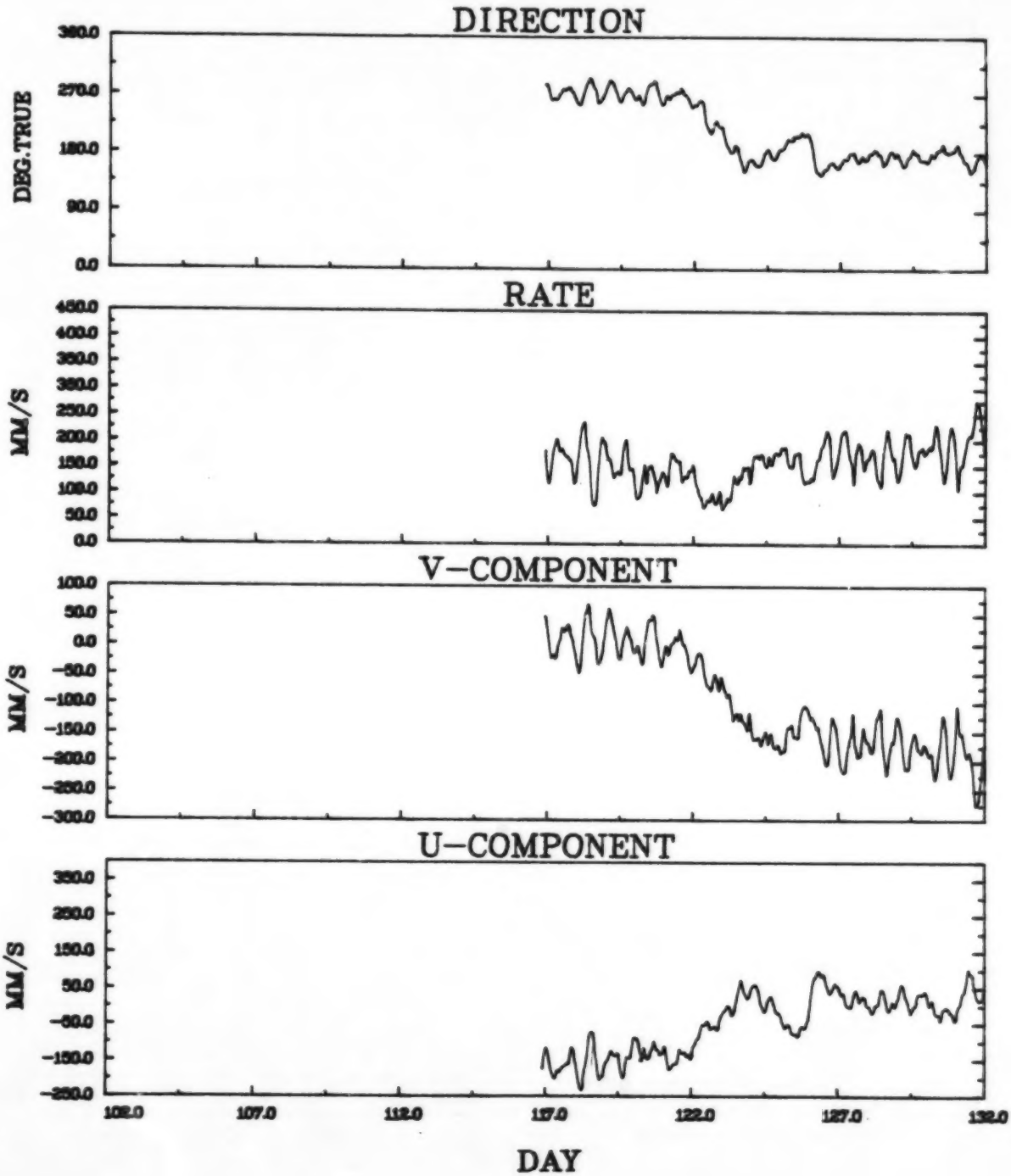
CHAN	NAME	UNIT	NUMBER	MIN	MAX	MEAN	INTERCEPT	TREND(/SEC)	VARIANCE	STD. DEV.
1	V(21.4650M)	M/S	2712	-.2461E+03	.4236E+03	.8771E+02	-161.339	-.12300E-03	.25036E+05	.15823E+03
2	V(21.4650M)	M/S	2712	-.3090E+03	.7450E+02	-.1324E+03	-92.102	-.24786E-04	.64328E+04	.80204E+02

V(21.4650M) VS D(21.4650M)

M/S

DEG.TRUE		SUB TOTAL	OUT OF RANGE	0.00 TO 50.00	50.00 TO 100.00	100.00 TO 150.00	150.00 TO 200.00	200.00 TO 250.00	250.00 TO 300.00	300.00 TO 350.00	350.00 TO 400.00	400.00 TO 450.00
300.00 TO	320.00	1	*			.0						
280.00 TO	300.00	120	*		.9	1.9	2.2	.9				
260.00 TO	280.00	227	*		1.0	3.6	2.6	1.1				
240.00 TO	260.00	53	*		.2	1.3	.4	.1				
220.00 TO	240.00	35	*		1.1	.2						
200.00 TO	220.00	102	*	.4	.8	1.3	1.1	.2				
180.00 TO	200.00	342	*	.1	.8	4.0	4.8	2.2	.7	.0		
160.00 TO	180.00	695	*	.2	.0	3.7	7.0	6.7	5.8			
140.00 TO	160.00	226	*	.1	.6	.9	3.2	2.4	.7	.2	.1	
120.00 TO	140.00	374	*	.0	.2	.8	.8	2.2	5.3	3.6	.9	
100.00 TO	120.00	579	*		.1	.7	.9	1.0	3.7	4.9	6.6	3.5
80.00 TO	100.00	13	*			.2		.2	.0			
60.00 TO	80.00		*									
40.00 TO	60.00		*									
20.00 TO	40.00		*									
0.00 TO	20.00	10	*	.4								
SUB TOTAL		2712	0	32	140	495	621	444	440	238	206	96

STATION 21 4650 m
25 APRIL–2 JUNE 1972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180.0
90.0
0.0
RATE
MM/S
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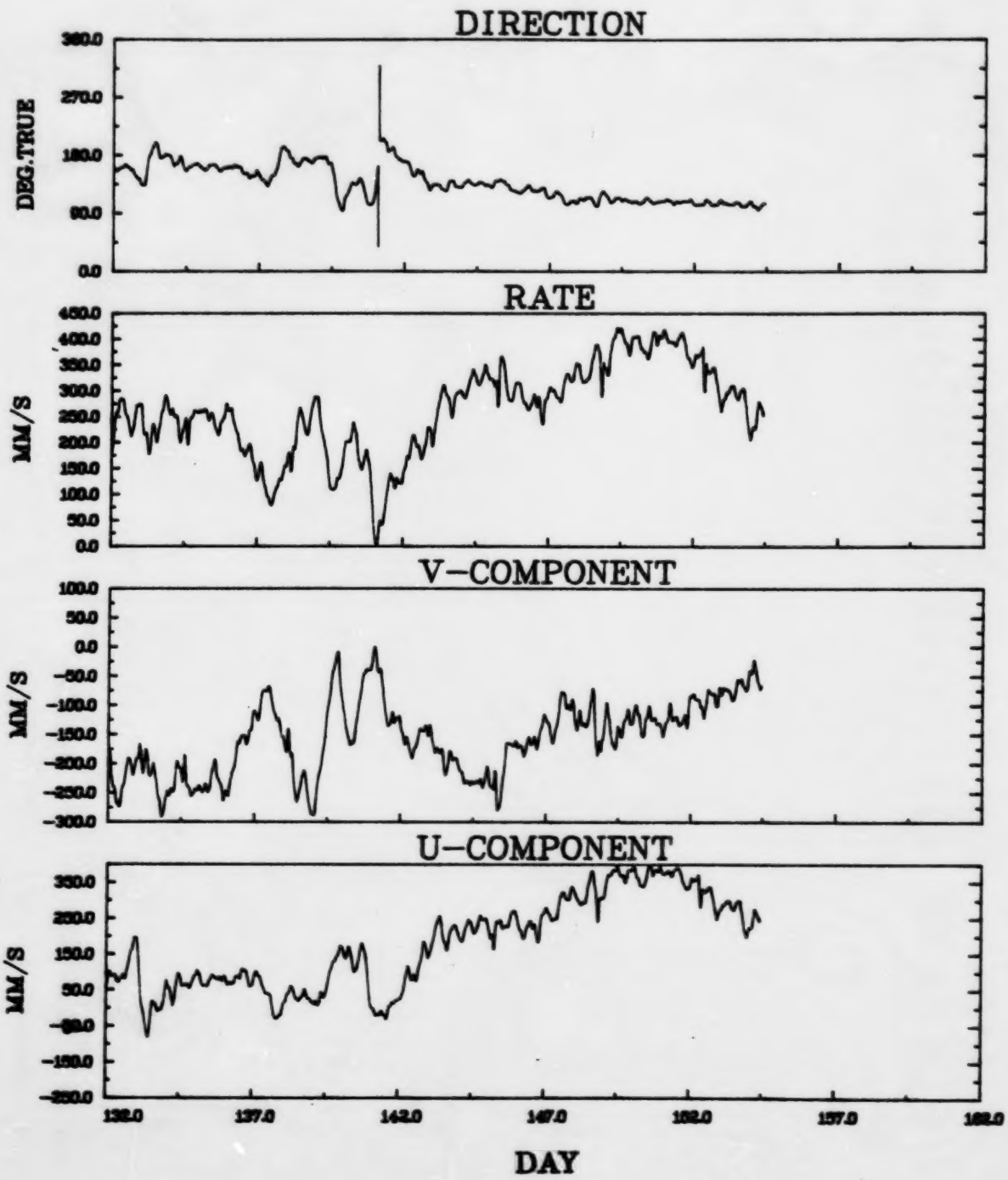
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
V-COMPONENT
MM/S
100.0
50.0
0.0
-50.0
-100.0
-150.0
-200.0
-250.0
-300.0
U-COMPONENT
MM/S
350.0
250.0
150.0
50.0
-50.0
-150.0
-250.0
102.0
107.0
112.0
117.0
122.0
127.0
132.0
DAY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270.0
180.0
90.0
0.0
RATE
MM/S
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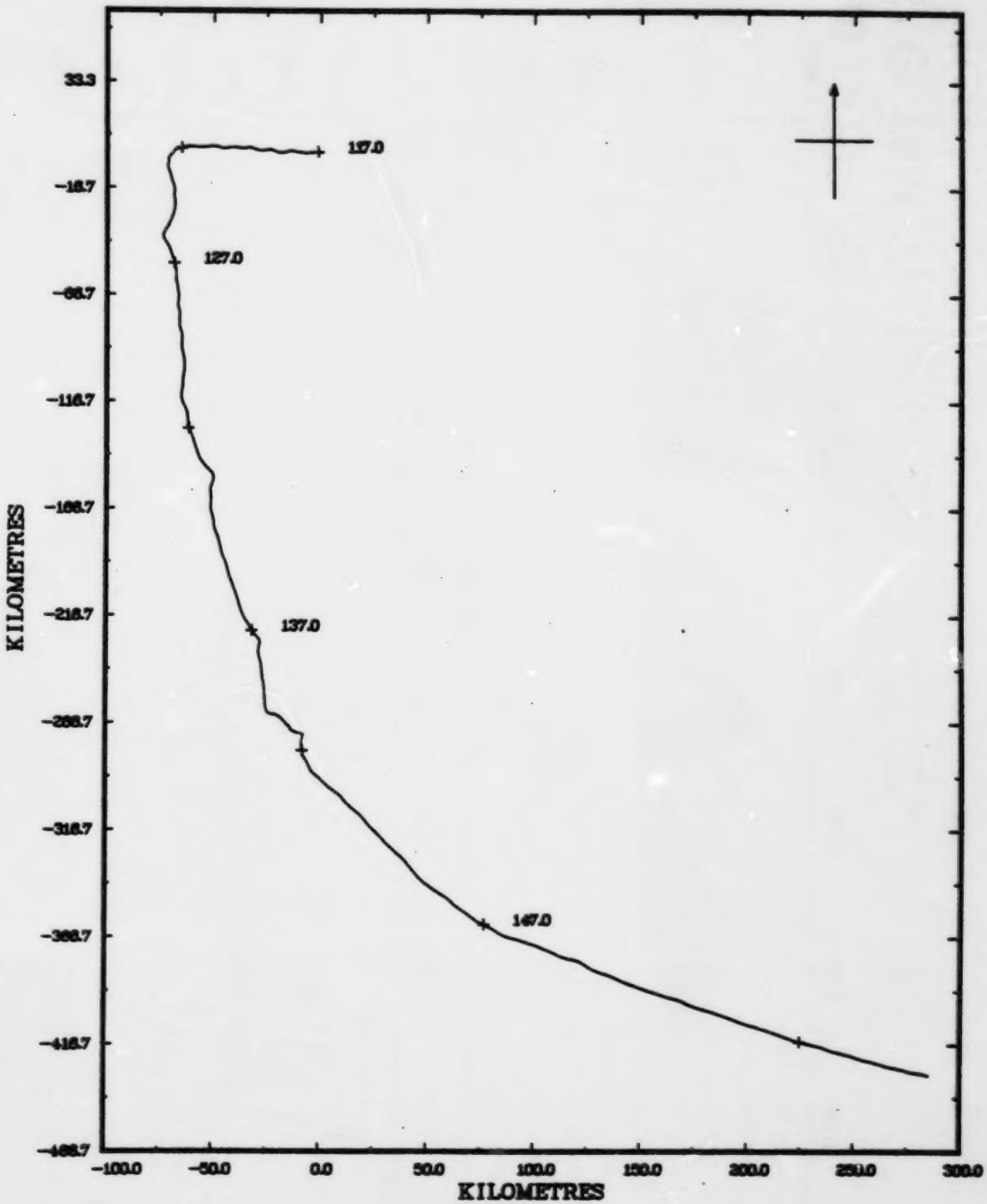
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
V-COMPONENT
MM/S
100.0
50.0
0.0
-50.0
-100.0
-150.0
-200.0
-250.0
-300.0
U-COMPONENT
MM/S
350.0
250.0
150.0
50.0
-150.0
-250.0
132.0
137.0
142.0
147.0
152.0
157.0
162.0
DAY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-368.7
-418.7
-468.7
KILOMETRES
127.0
127.0
137.0
147.0
-100.0
-50.0
0.0
50.0
100.0
150.0
200.0
250.0
300.0
KILOMETRES

MM/S
-3000
-2000
-1000
0
1000
2000
3000
DAY
157.0
162.0
167.0
172.0
177.0
182.0
187.0
MM/S
-3000
-2000
-1000
0
1000
2000
3000
97.0
102.0
107.0
112.0
117.0
122.0
127.0
132.0
137.0

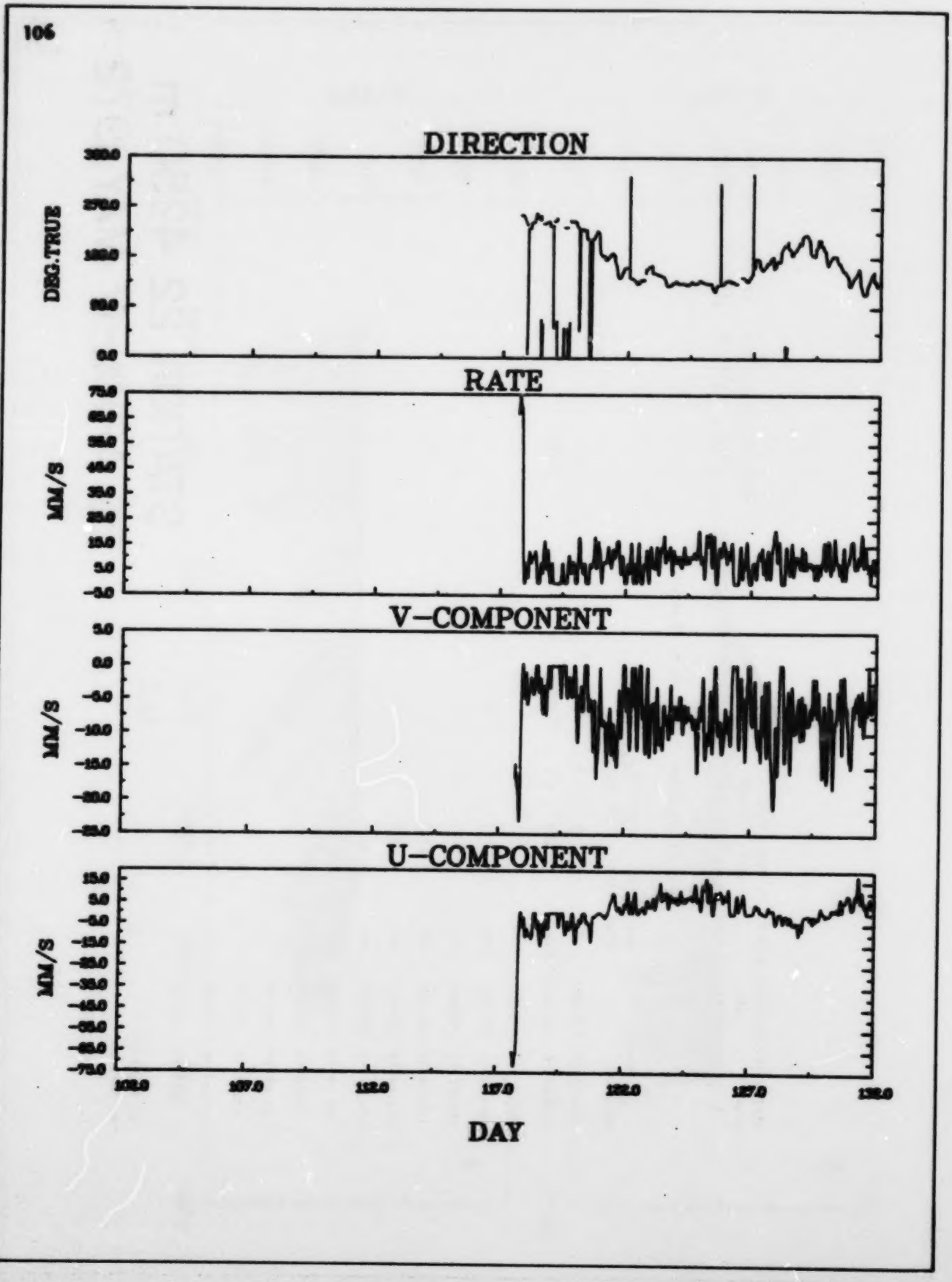
VELOCITIES RESOLVED ALONG 0. DEG. TRUE

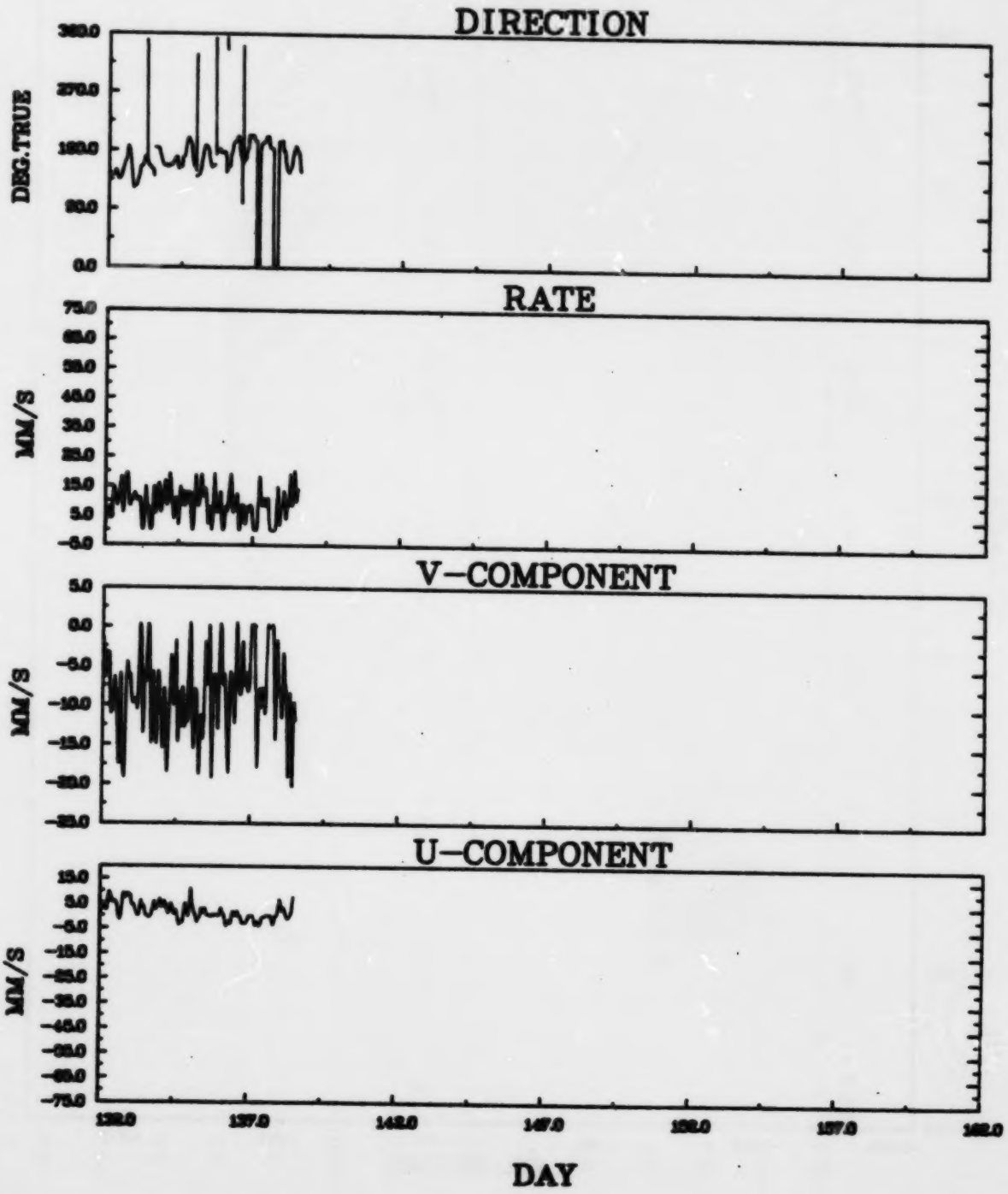
CHAN	NAME	UNIT	NUMBER	MIN	MAX	MEAN	INTERCEPT	TREND(/SEC)	VARIANCE	STD. DEV.
1	V(22,4250M)	CM/S	1512	-.7471E+02	.2570E+02	-.7468E+00	-3.103	-.42620E-03	.11714E+03	.10823E+02
2	V(22,4250M)	CM/S	1512	-.3132E+02	.2570E+02	-.7468E+00	-3.416	-.16348E-03	.83170E+02	.91203E+01

R(22,4250M) VS D(22,4250M)

CM/S DEG.TRUE		SUB TOTAL	OUT OF RANGE	0.00 TO 50.00	50.00 TO 100.00
260.00 TO	280.00	9	*	.5	.1
240.00 TO	260.00	108	*	6.0	1.2
220.00 TO	240.00	108	*	7.1	
200.00 TO	220.00	108	*	7.1	
180.00 TO	200.00	252	*	16.7	
160.00 TO	180.00	283	*	18.7	
140.00 TO	160.00	361	*	23.9	
120.00 TO	140.00	265	*	17.5	
100.00 TO	120.00	13	*	.9	
80.00 TO	100.00		*		
60.00 TO	80.00		*		
40.00 TO	60.00		*		
20.00 TO	40.00		*		
0.00 TO	20.00	5	*	.3	
OUT OF RANGE		0	0		
SUM TOTAL		1512	0	1493	19

STATION 22 4250 m
26 APRIL-17 MAY 1972


DIRECTION
DEG.TRUE
RATE
KM/S
V-COMPONENT
KM/S
U-COMPONENT
KM/S
DAY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90.0
0.0
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CM/S
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-15.0
-20.0
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U-COMPONENT
CM/S
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5.0
-5.0
-15.0
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-35.0
-45.0
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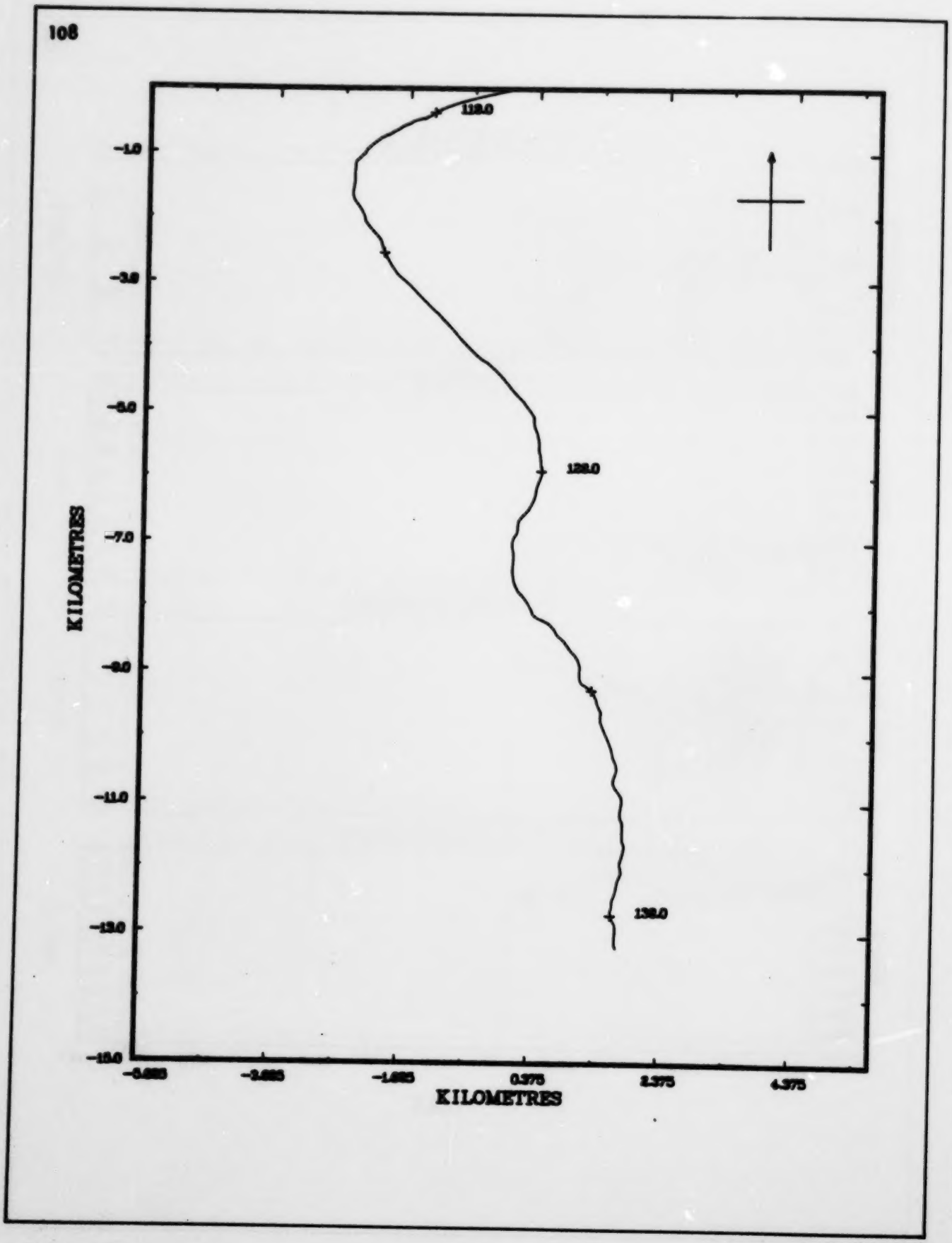
DAY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-2.625
-1.625
0.375
2.375
4.375
KILOMETRES

DAY
MM/S
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100
50
0
-50
-100
-150
0720
0730
0740
0750
0800
0810
0820
0830
0840
0850
0900
0910
0920
0930
0940
0950
1000
1010
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1030
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2310
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2330
2340
2350
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0020
0030
0040
0050
0100
0110
0120
0130
0140
0150
0200
0210
0220
0230
0240
0250
0300
0310
0320
0330
0340
0350
0400
0410
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0500
0510
0520
0530
0540
0550
0600
0610
0620
0630
0640
0650
0700
0710
0720

VELOCITIES RESOLVED ALONG 0. DEG. TRUE

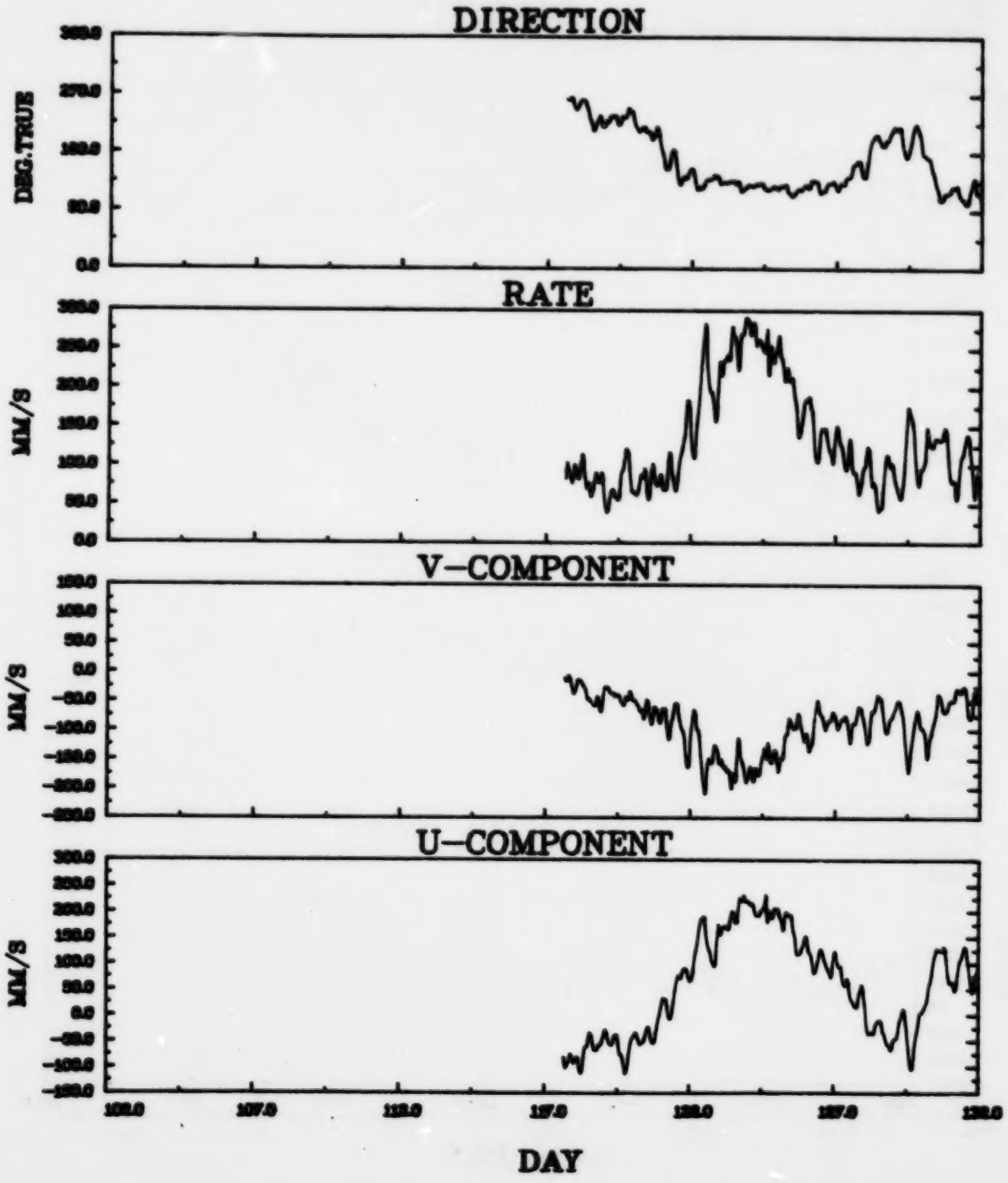
CHAN	NAME	UNIT	NUMBER	MIN	MAX	MEAN	INTERCEPT	TREND(/SEC)	VARIANCE	STD. DEV.
1	U(22,4750M)	KM/S	2640	-.1887E+01	.6618E+01	.6873E+00	70.343	.3033E-04	.3784E+04	.7803E+02
2	V(22,4750M)	KM/S	2640	-.2515E+01	.1265E+01	-.4526E+00	-116.784	.4637E-04	.3557E+04	.5962E+02

P(22,4750M) VS D(22,4750M)

DEG.TRUE	KM/S	SUB TOTAL	OUT OF RANGE	0.00 TO 50.00	50.00 TO 100.00	100.00 TO 150.00	150.00 TO 200.00	200.00 TO 250.00	250.00 TO 300.00	300.00 TO 350.00
260.00 TO	280.00	30	*		.8	.3				
240.00 TO	260.00	51	*		1.3	.7				
220.00 TO	240.00	119	*	.3	3.6	.6	.0			
200.00 TO	220.00	132	*	.2	3.8	.8	.2			
180.00 TO	200.00	93	*	.3	1.7	1.3	.3			
160.00 TO	180.00	205	*	.5	5.8	1.4	.1			
140.00 TO	160.00	331	*	1.0	8.4	1.9	1.0	.2	.1	
120.00 TO	140.00	675	*	1.0	9.8	5.7	2.0	3.3	1.7	.1
100.00 TO	120.00	346	*	.6	7.6	3.8	.3	.8	.0	
80.00 TO	100.00	271	*	2.0	2.9	2.0	1.6	1.6	.2	
60.00 TO	80.00	270	*	.5	1.8	4.1	2.0	1.9		
40.00 TO	60.00	107	*	.2	.9	2.1	.8	.0		
20.00 TO	40.00		*							
0.00 TO	20.00	10	*	.4						
OUT OF RANGE		0	0							
SUB TOTAL		2640	0	184	1274	650	222	203	105	2

STATION 22 4750 m

26 APRIL-2 JUNE 1972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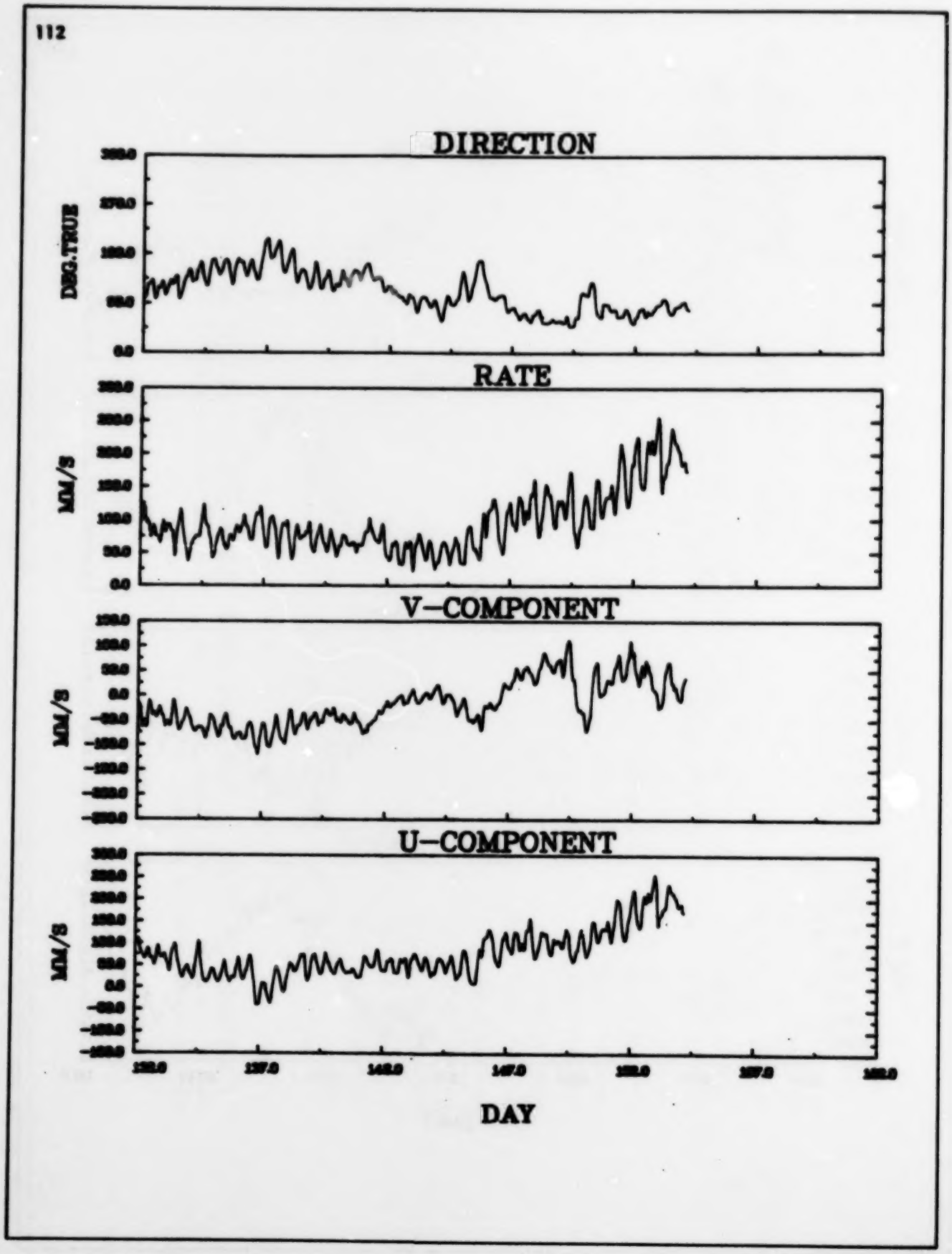
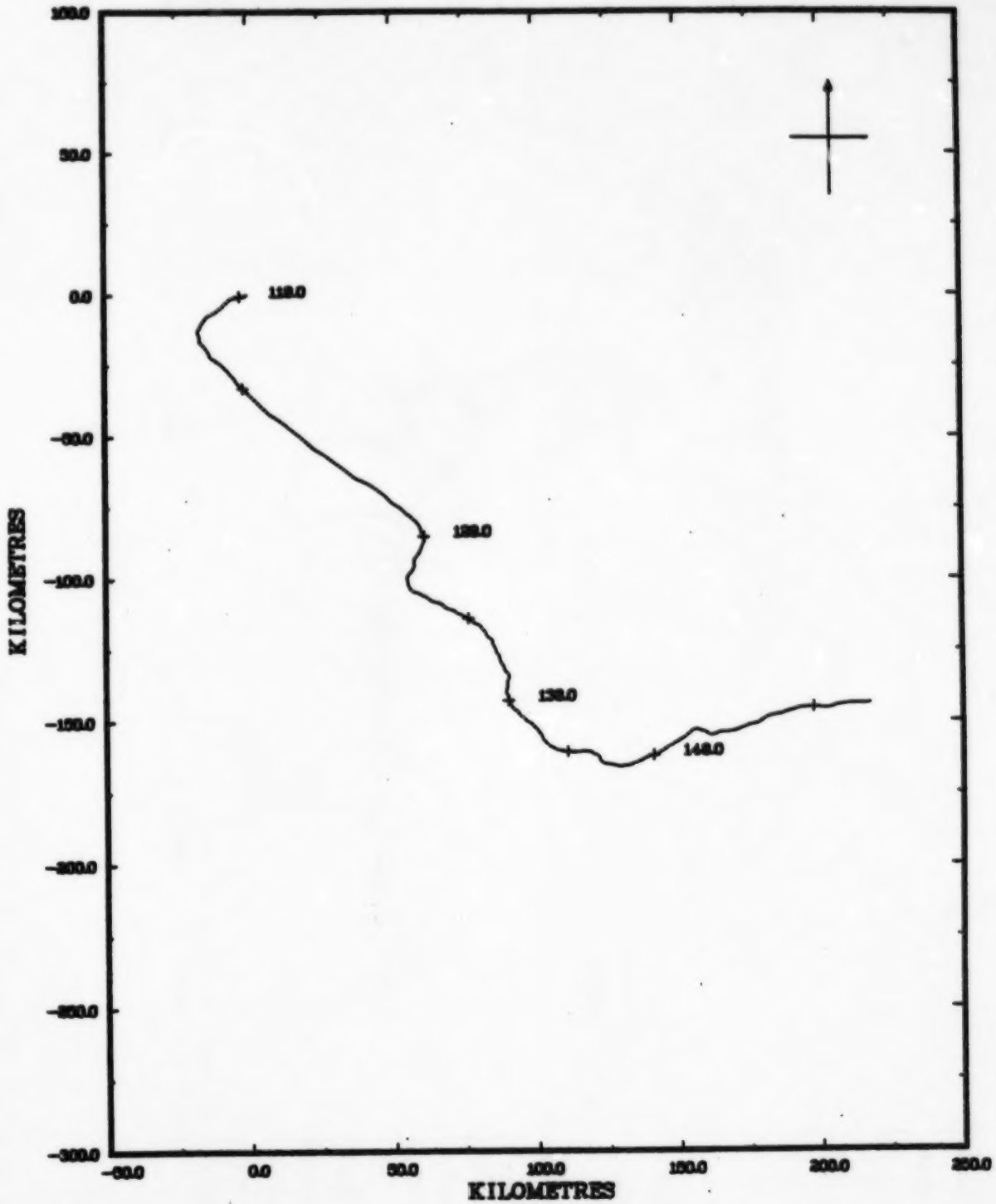
DEG.TRUE
RATE
MM/S
V-COMPONENT
MM/S
U-COMPONENT
MM/S
DAY


DIRECTION
DEG.TRUE
RATE
MM/S
V-COMPONENT
MM/S
U-COMPONENT
MM/S
DAY


100.0
50.0
0.0
-50.0
-100.0
-150.0
-200.0
-250.0
-300.0
KILOMETRES
118.0
128.0
138.0
148.0
-50.0
0.0
50.0
100.0
150.0
200.0
250.0
KILOMETRES

MM/S
2000
1500
1000
500
0.0
-500
-1000
-1500
-2000
07/31
08/01
08/11
08/21
09/01
09/11
09/21
10/01
10/11
10/21
10/31
11/10
DAY